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Original.

Cultivation of the Human Tumors in vitro

By

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(Plate VI–X.)

In the field of malignant tumor research it has become increasingly evident in the recent years that new investigating methods must be worked out before further important advances can be expected. The recently devised method of tissue cultivation in vitro (*Harrison, Burrows*) by which we are able to study isolated somatic cells, allows to introduce the known and measurable factors into experiments; it may also contribute to an important advance of the cancer research, if one could make clear biomorphological properties of human tumor cells in such a way.

Furthermore, since it is possible to subject tumor cells, thus isolated, to various agencies, it may be suggested that we have also in the new method a possible means for solving another great tumor problem, namely, the treatment of malignant growth.

In the study of human tumors, the method will probably fill a great need, since it is not possible to secure the continued propagation of human tumors by transplantation, by which only tumors of certain lower animals may be pursued.

Through the kindness of Prof. Dr. *Sh. Sekiguchi* and of his assistants of the surgical clinic, I have been able to make many cultures with fresh and small fragments of human tumors taken from the patients by their operations and to study the growth of the various human malignant as well as benign tumors in vitro. I could also research the morphologic characters and biological changes of the cancerous and other cells during the cultivation.

History.

In spite of a large number of experiments in the tissue culture of animal tumors, there are very few works with regard to the explantation of human tumors. The scantiness of such researches must probably be caused by the difficulties to obtain fresh suitable materials and proper media.

For instance many of the human tumors grow out in the alimentary tract and before the tumor tissues are innoculated into the plasmatic media, they are already infected by the micro-organisms which constantly live innumerably in this tract.

Furthermore, the higher differentiation of human somatic cells and the rapid liquefaction of the clotted plasmatic media make these experiments more difficult.

In 1910 *Carrel* and *Burrows* made a few cultures in vitro with fragments of human sarcomatous tissue taken by operation from a woman thirty-five years old. Thirty minutes after the exstirpation small fragments of the tumor were cultivated in plasma taken from the blood of the patient and incubated. It was observed in some cases that after a few days the fragments were surrounded by cells, but liquefaction of the medium gener-

ally occured. The tissues were kept in a condition of survival for a few days, but no real cultures were obtained.

This is the first attempt to culture the human malignant tumor in vitro I have ever seen recorded in the bibliography.

In the next year (1911) they have again tried to make cultures of the human tumors in the same manner as above mentioned. Three sarcomata and several carcinomata were subjected to them; the former consisted of two giant-cell tumors and a fibrosarcoma; the latter, one from the lip, and the other from the male and female breasts.

They failed to culture the giant-cell tumors for the reason that they caused rapid liquefaction of the medium. The medium about the fibrosarcoma underwent partial liquefaction, but as a thin and firm clot adhered to the cover-glass, growth was still possible.

Polygonal and spindle-shaped cells wandered into the medium and remained isolated and did not produce a new dense tissue.

On the contrary they did not succeed in cultivation of carcinomata, for the specimens with which they worked rapidly liquefied the plasmatic medium, but some growth was obtained from a small carcinoma of the breast.

Losee and *Ebeling* (1914) attempted variously to modify the medium with the purpose of preventing liquefaction and they succeeded at last to keep human fetal tissue, derived from fresh cadavers, in a condition of independent life for several generations. The medium they employed was composed of equal parts of normal human plasma and *Ringer*'s solution and varying quantities of extract obtained from fresh fetal cadavers.

They attempted then to culture human sarcomatous tissue in this manner. Two experiments were made in which fragments of human sarcomatous tissues were cultured, but there was also usually evidence of slight liquefaction around the primitive fragments.

The results obtained by them were, that it is possible to culture fragments of human sarcomatous tissue in vitro for several generations, and they concluded from this experiment that the method employed may prove of value in the study of the growth of human malignant tumors.

In 1914 *D. Thomson* and *J. G. Thomson* were able to obtain some successful growths in vitro of the human ovarian papilloma and carcinomatous gland from the neck in a medium composed of fowl plasma to which extract of the human tissues or extract of chicken embryo, had been added.

In 1916 *Lambert* was successful to overcome the difficulty of cultivation of human tissue cells by adding to human plasma or serum a small quantity of fowl or pigeon plasma, the fibrin of which is highly resistent to digestion by tissue ferments.

Cultures of human tissues as well as human tumors were made on the day of removal. A typical mixed tumor removed surgically from the region of the parotid gland was cut into small pieces and cultured in this manner. Ten cultures put up immediately after the operation grew well, showing after two or three days' incubation numerous large cells of irregular shape with frequent mitotic pictures.

Cultures made on the second and fourth day of preservation in the ice box, showed similar activity, though in the case of the tissue preserved for a longer time there was a longer latent period before the migration was observed.

In another experiment in which a piece of glioma was used, some growth was obtained after eight days' preservation, but none after ten days'.

Recently *Kiaer* and *Fischer* cultivated the human glio-sarcoma to begin with in a mixture of 20 per cent chicken plasma in extract of the sarcomatous tissue and human serum.

Later, the same strain of sarcoma was cultivated in chicken embryonic tissue juice from young chicken embryos, for about a

month, but the result of these experiments is not yet published (1925).

Technique.

Recent papers on the subject render unnecessary a detailed description of the general phenomena of growth in tissue cultures and the technique of the method.

In my cases many of the explants, as previously described, consisted of small pieces of human tumor tissues taken from the patients by operation, but on the other cases some of the explants are derived from fresh cadavers. The cultures are made about a half or one hour after excision with the exception of these from the cadavers.

The media employed in these experiments are composed of normal human plasma mixed with a half quantity of *Ringer*'s solution and hens plasma. The human plasma was obtained from comparatively healthy patients and nurses, and looking back upon this fact, I have no words to express my cordial gratitude to them. When such plasma could not be got, I have inevitably used my own blood for several times.

During the summer, as the plasma is apt to clot before the tumor fragments are incubated into it, the media are mixed with a small amount of *Heparin* according to *Craciun*'s method.

In my investigations only the large plate cultures have been prepared, but these are not so suitable to make a elaborate observation in the living like in the small hanging drop cultures, all the specimens were fixed after varying periode of time, then stained and investigated in detail.

Experiments.

Twenty-six examples of human tumors were subjected to this investigation as follows: (Table I).

Table I

Kinds of Tumors	Localities	Nos. of cases	Protocollnumbers
Carcinomata	neck	1	(13)
	breast	9	(1), (3), (6), (7), (8), (9), (10), (24), (26)*)
	tongue	2	(5), (17)
	penis	2	(4), (15)
	mediastinum	1	(19)*)
	cheek	1	(2)
	skin	1	(20)
	rectum	1	(14)
	stomach	1	(22)*)
	oesophagus	1	(16)*)
	thyroid	1	(18)
	anus	1	(25)
Sarcomata	cheek	1	(23)*)
	neck	1	(21)
	palate	1	(12)
Fibroadenoma	breast	1	(11)

*) taken from cadavers.

In some cases, when the explants are taken from the metastasis of the neighbouring lymphatic glands, it happend that the explants were only the inflammatory lymphatic glands and no tumor cells could be found in them.

In addition to these mistakes, the infection of the incubated fragments and the liquefaction of the media made only the following twelve cases possible to be investigated among twenty-six examples.

Serie I, consists of nine carcinomatous cases, among them one from the neck (case 13), three from the female breast (cases 8, 9 and 10), one from the tongue (case 17), one from the mediastinum (case 19), one from the rectum (case 14), one from the oesophagus (case 16) and one from the thyroid (case 18).

Serie II, only two sarcomata are employed, one from the palate (case 12) and the other from the neck (case 21).

Serie III, one fibroadenoma from the female breast (case 11).

Results.

In the first stage of cultivations I have frequently recognised that remarkable necrosis took place on the peripheral part of the explanted pieces, what undoubtedly is due to the mechanical stimulus by cutting off. Further, in some specimens I have also observed that the whole primitive fragments became entirely necrotic from the beginning of the cultivation and stained homogeneously.

Such severe necrosis has been observed only when the primitive fragments were infected by the microorganisms or when the materials were excised from the central necrotic part of the tumors or when they were taken from the cadavers kept for a very long time after death.

With the exception above mentioned, I have been able to cultivate the various human malignant as well as benign tumors outside of the body, even though some of them have shown no active growth or no real cultivation of tissues according to the definition of *Carrel* and *Burrows*, but only a survival of tumor cells.

The outline of the results of my cultural and histological investigation upon the human tumor cells is as follows (Table II).

Serie I. Carcinomata.

A. Carcinoma with myxomatous stroma (case 13).

At first I will describe a very peculiar case of carcinoma removed from a man's neck, the stroma of which appears just as the myxoma. The stroma being pretty abundant consists also of

Table

Kinds of tumors	Localities	No. of protocoll	After the excision	incubation			
				1	2	3	5
Carcinomata	neck	(13)	30′	+	+	+	+++
	breast	(8)	20′	0	0	++	++
	breast	(9)	32′	0	0	−	−
	breast	(10)	18′	0	+	+	+
	tongue	(17)	27′	+	+	+++	+++
	oesophagus	(16)*)	40h	−	+	+	+
	thyroid gland	(18)	24′	+	+	+++	+++
	mediastinum	(19)*)	45h	+	−	−	−
	rectum	(14)	21h	−	0	−	−
Sarcomata	palate	(12)	19h	0	+++	+++	+
	neck	(21)	21h	+	+	+	+
Fibroadenoma	breast	(11)	20h	0	+	++	++

Remarks:—

0 — No specimens are observed after the mentioned days of incubation.

− — No regeneration of tumor cells is to be found.

+ — Regeneration of tumor cells within the original fragment.

II.

(days)						Microscopic properties of original tumors	
7	8	10	12	15	20	typ of tumors	stroma
++	0	++	0	—	++	squamous, building pearls	pretty abundant, myxomatous
0	—	0	0	—	0	scirrhous	abundant
—	0	—	—	—	0	partly adenocarcinoma, mostly scirrhous	abundant
+	0	—	—	—	—	partly scirrhous, partly medullary	mostly dense fibrous
++	0	—	0	—	0	squamous, building pearls	not much abundant but dense fibrous
+	0	—	0	—	+	mostly medullary, partly scirrhous	dense fibrous not abundant
++	0	—	0	—	0	simple	very poor
0	0	—	0	0	0	medullary, partly scirrhous	fibrous, poor
++	0	—	0	—	0	scirrhous, partly medullary	dense fibrous, but poor
—	0	—	0	—	—	spindle-shaped cells	poor
++	0	++	0	++	++	shmall round cells	very poor
0	++	0	0	++	0	growing in intracanalicular papillary form	pretty abundant with myxomatous appearance

++ — The proliferation of tumor cells on the margin of original fragment.

++ — The active proliferation of tumor cells into plasmatic medium.

*) — Taken from the cadavers.

homogeneous intercellular substance which is stained blue by hematoxylin and of somewhat scattered epithelial cell masses. These cells often present a stellate appearance with long branching cytoplasmic processes or they are spindle shaped and mostly arranged in alveoli being surrounded by the stroma mentioned. Almost in every alveolus there appear one or more pearls. All microscopic features just described suggest that it may be a mixed tumor of squamous epithelioma and myxoma, though in today's knowledge of pathology such a combination as a real mixed tumor is generally not accepted. The results of the cultural investigations differ also from those of other carcinomata.

In 1916 *Lambert* was successful in cultivating a typical human mixed tumor, but there has been no detailed description on the morphological changes and characteristics of these tumor cells.

On the first day of explantation the tumor cells exhibit nearly the same appearance as that of the original uncultivated fragment, and no degenerating process is to be seen. In some culture examples, however, there appear within the fragment a few long spindle shaped cells which can by no means be morphologically cells of the connective tissue but of the cancer epithel. They do not arrange in alveoli but sometimes in a slightly curved line.

On the second day the mixomatous cells are slightly degenerated and on the third both myxomatous and epithelial cells have more and more declined.

Some of the epithelial cells on the periphery of the explanted piece, however, indicate a great activity tending to the proliferation into plasmatic medium.

On the fifth day many of the epithelial cells invade in groups the plasmic medium neighbouring directly, but the myxomatous cells do not so at all. Mitotic pictures are often seen in and out of the original fragment. On the other hand the stroma as well

as the epithelial cancer cells within the fragment undergo mucous degeneration.

It is very interesting to see that these cells wandering in the plasma in groups arrange in the form of a normal sebaceous gland or of a hair matrix and their central portion presents often a beginning formation of pearls.

On the seventh day the microscopic appearance of cells wandering into plasma and staying in the explanted fragment is almost the same as that of the fifth, but they undergo further degeneration and their nuclei are also pyknotic and stained very deeply.

The stroma cells having lost their nuclei melt down and build often irregular cysts.

While the cancer cells in the center of some alveoli undergo colliquation or seldom mucous degeneration, there appear new proliferated epithelial cells surrounding partly the alveoli.

The liquefaction of the medium occurs very slightly around the new cell groups on the fifth and the seventh day of incubation.

On the tenth day the degeneration of all the tumor cells has progressed, especially severe in the central portion of the explanted fragment.

Though such necrotic process has advanced with the day of incubation, I could recognize some degenerating but yet living glandular cells on the margin of the old fragment even on the twentyth day (fig. 1).

§ Characteristic growth of the tumor.

In the explantation of this tumor the proliferation of cells takes place already after 24 hours, but most evidently on the fifth day of incubation, when they begin to invade the surrounding medium, and it is somewhat later comparing with that of *Lambert*'s.

Of course the elementary cells of different kinds composing the human mixed tumors proliferate naturally into plasma after a different latent period of explantation.

The myxomatous cells in my case show only degeneration without any signs of regeneration through the whole observation. This may probably be due to their own mucous degeneration, by which the energy for active outgrowth is almost lost.

On the contrary the epithelial cells exhibit some characteristic growth; namely these cells proliferate into plasma in groups always in connection of cells to the original fragment, arranging in a form of sebaceous gland or, in some cases more of hair matrix.

In other cases, however, these epithelial cells do not assume the glandular arrangement, but they are disorderly arranged side by side forming of a germ-like proliferation into plasmatic medium (fig. 1).

With the progress of retrograde changes the epithelial cells are especially disorderly arranged in the old explanted piece.

Mitotic pictures are only observed in the epithelial cells. In this case they do not, however, build a dense new tissue in the plasma like in other cases of carcinoma cultures.

Serie I. B. Some usual carcinomata.

From the first stage of the explantation of carcinoma cells there is more or less liquefaction of plasmatic medium around the original fragment, especially there, where the carcinoma cells begin to migrate, it seems to be more severe.

If the materials are taken from the cadavers kept for a long time after death, the liquefaction of medium takes place most severely, as if they were infected by microorganisms, but no colonies are macroscopically and microscopically to be found.

As soon as liquefaction takes place, all connections between the original fragment and new growth is broken off and on account of this change of the medium all further outgrowth from

the explant is impossible. When only slight liquefaction occurs, growth of new cells manifests itself after varying periods of incubation.

During the first twenty-four to forty-eight hours after incubation there is usually no evidence of active growth of carcinoma cells, even though there exists a flourishing regenerative process or survival condition in the original fragment. In other words, there is no migration of human carcinoma cells into plasmatic medium within forty-eight hours after preservation. I would style this period as a latent period of human carcinoma cells in vitro.

On the third day, however, the cultures show high activity and numerous mitotic pictures are to be seen.

For example, by cultivation of carcinoma from the female breast (case 8) the fusiform tumor cells spread out in groups on the margin of the original fragment and the medium around them was considerably liquefied (fig. 2 and fig. 3 of case 9). In the other case of breast carcinoma (case 10) nearly the same findings were to establish (fig. 4). Further, by the carcinoma from the tongue (case 17), the cancer cells grew out not only on the margin of the explanted piece but far into plasmatic medium, and some of them built new dense tissue in it (figs 5, 6 and figs 10 and 11 of carcinoma of rectum, case 14).

No visible connection of cells between the explant and new growth of cancer cells has been found.

The microscopic findings of carcinoma from thyroid (case 18) on the third day were nearly identical with that of tongue (fig. 9).

Such an active outgrowth of carcinoma cells, though somewhat varied in details, was on the whole almost analogous with that of the fifth day's. All the regenerative process had gradually declined and on the seventh day the degenerating process had remarkably advanced, the carcinoma cells withered and most of

their nuclei became necrotic too.

During third to fifth day of incubation the active outgrowth of the carcinoma cells had already reached its height.

I would, then, name it as a period of active outgrowth of human carcinoma cells in vitro. For that reason it must be chosen such a period to make any subcultures for several generations.

Against to this, the next stage following to the seventh day shall naturally be called the period of degeneration of human carcinoma cells in vitro. In fact, I could hardly observe any signs of activity of carcinoma cells in the explant as well as in the plasmatic medium during this period.

With surprise I could observe that the carcinoma cells from oesophagus (case 16) kept for fourty hours after death, had indicated their livelihood even on the twentyth day of incubation without any subcultures for generations, and still more the nuclei in some cases underwent mitotic division in the old piece (figs. 7 and 8).

The carcinoma cells, thus cultivated, without regard to the severe necrosis and homogeneous stain of the explanted piece, could survive and keep their fine construction for a very long time in the culture.

Such a fact has been shown conclusively in a large number of experiments and that is the most important point of the morphologic characters of carcinoma cells.

§ Characteristic growth of human carcinoma cells.

In reference to the characteristic growth of animal carcinoma cells many investigators have described the general conclusions upon the nature based upon the observation of cells cultivated under artificial conditions.

Lambert and *Hanes* have recognized that the outgrowth of carcinoma cells can be obtained in normal plasma and even in

plasma from alien species, with the characteristic sheet-like extension of the cancer cells, with several groups in the fibrin meshwork beyond the advancing border.

Lambert has further pointed out that the epithelial cells of all kinds, normal or neoplastic, tend to spread out in sheets or groups.

Recently *Fischer* and *Laser*, dependently or independently, have several times shown the same fact about the animal carcinoma cells.

In spite of a great number of such descriptions upon the nature of animal carcinoma cells, there is almost no observation in regard to that of human cancer cells.

According to my results the human carcinoma cells in the explanted fragment, differing more or less from each other, are hardly able to escape from the retrograde changes in a certain degree in all cases.

But the degree of the change is much slighter than that of the stroma cells; that is, I have often observed that the carcinoma cells, notwithstanding the severe necrosis and the homogeneous stain of the connective tissue cells, show the most vigorous activity and very often the mitotic division in them. (figs. 3 and 5).

Not only I but also *Fischer* has observed the same fact in his culture of mouse carcinoma cells, in which the cancer cells had annihilated the homologeous fibroblasts contrary to normal epithelial cells. In conformity with such a characteristic nature of carcinoma cells, it shall be enough to explain their capacity for unlimited growth in the body.

That the carcinoma cell is a particularly hardy cell, and that his malignancy is due in some measure at least to this property, is in the first place a popular notion.

This idea has, indeed, received some support from studies on the resistance of certain rat and mouse carcinomata to

freezing and to toxic chemical substances by *Jensen*, *Gaylord*, and *Salvin-Moore* etc.

On the contrary *Ribbert* has called attention to the tendency of carcinoma to necrosis, maintaining that cancer cells are very susceptible to injuries of many kinds, and that this state of low vitality is referable to their poor vascularization.

Lambert is also inclined, in accordance with the results of his own experiments, to endorse the view that the animal carcinoma cell is a cell of relatively low resistance.

I would, based upon my investigation, assert that the human carcinoma cells are resistanter against the changes in food supply and environment than the stroma cells at least in the same explanted fragment and in the first stage of cultivation.

But I have often seen in some specimens that the furious activity of connective tissue cells occurs firstly at the late stage of incubation and after the necrobiosis of a great part of the tumor cells.

Furthermore the nature of carcinoma cells which migrated into plasma differ fairly with that of stroma cells.

Of course it is rather impossible to make direct observation in the living with regard to the movement of each tumor cell, since the culture method is not, as before mentioned, that of the hanging drop culture.

Comparing with stroma cells, the carcinoma cells have generally proliferated out in earlier stage and migrated further into plasma than the former. Namely on the third day of incubation I have often seen the migration of tumor cells, when no fibroblasts are to be found in plasma.

But the liquefaction of medium takes place around the explanted piece and the carcinoma cells are prevented to outgrow, they tend to spread out in sheet-like form, only one cell in thickness on its margin or they are interposed from the original fragment by the liquid plasmatic medium standing in a row (figs. 1, 5, 6, 7 and 8).

In the latter case carcinoma cells assume a special ring-like form around the explanted piece. But when only slight liquefaction of medium occurs, the proliferation is more lively and they spread out in groups into plasma (figs. 10 and 11).

On this occasion I have seen some connection of tumor cells between new growth of tumor cells and the original fragment on the one hand, and some times there is no cell connection between them on the other.

However it is not supposed, that many carcinoma cells move in one group through the plasma, carcinoma cells may individually migrate far into it by their own motility and may build such a group of tumor cells here.

I have in fact often seen a single cancer cell in plasma apart far from the original fragment, that means, it has a great motility of its own.

This fact probably throws light on the mechanisms of the invasive growth and spread of carcinoma in the body. It is not necessary to regard the formation of metastatic tumor nodules always as a result of the passive transportation of cells from a primary tumor by only the blood or lymph stream, when the cells may easily get from place to place by their own powers of locomotion.

The nuclei of tumor cells undergo in some good conditions mitotic division in and out of the old piece. I have been able to demonstrate in the cultures, that most of young tumor cells are round or oval, big and rich in vacuoles and that they often show cytoplasmatic processes.

The nuclei of the young daughter-cells are always stained deeper than these of the old resting cells.

Any regenerative life conditions of cancer cells are no more seen after the seventh day of incubation.

Serie II. Sarcomata.

Only two human sarcomata were subjected to this cultivation. They consist of one spindle-cell sarcoma from the palate (case 12) and one round-cell sarcoma from the neck (case 21) treated with X-Rays for several times.

A very long time passed (19 and 21 hours) before they were explanted, as the human plasma was hardly able to obtain just as it was wanted.

Accordingly the result of experiment probably may worse than that of the original sarcoma.

1) Spindle-celled sarcoma from the palate.

As the specimens are only few, they were not investigated within twenty-fourth hour of incubation, but on the second day of preservation the tumor cells in the primitive fragment indicated so good conditions 'of life as that of the original uncultivated tumor cells.

The spindle-shaped sarcoma cells wander out single or in form of a loosely connected chain, even if not so abundant in number, through the plasmatic medium, and their nuclei are long oval and rich in granules (fig. 12).

The liquefaction of medium occurs always more or less evidently around the migrated tumor cells and explanted fragment.

Out of this reason the tumor cells are extremely disturbed in their growth.

But on the third day the retrograde changes made rapid progress in cultures, especially severe in these sarcoma cells proliferated into plasma. The tumor cells have shrunk and have lost their cytoplasmatic branches, became almost round; their nuclei are also pyknotic and are stained deeper than ever (fig. 13).

Naturally most of tumor cells and stroma cells in the original fragment are undergoing degeneration too and some of them go so far as to necrosis.

On the fifth day of incubation, in spite of the severe

necrosis and homogeneous stain of other kinds of cells in the original piece, many of the sarcoma cells show a certain activity, but the proliferation of tumor cells can no more be observed.

On the seventh day such morphologic changes become more and more remarkably and I can only see a few living tumor cells in the old fragment. Further, after ten days of incubation, all kinds of cells became entirely necrotic and any living cells were no more found.

2) Round-cell sarcoma from the neck.

This tumor was treated with X-Rays for several times on account of impossibility for an operation. For this reason or not, the nuclei of all cells seemed to be rather pyknotic from the first stage of explantation.

It is characteristic that the liquefaction of medium and also retrograde changes of the periphery of the original fragment, which should occur in most of the cultures, takes place very slightly.

On the first day of incubation the tumor cells in the primitive fragment show, even though some of them undergo rather degeneration, the flourishing condition of activity, are especially manifested in these standing on the periphery of the explant.

The microscopic appearance of the second day is almost identically with that of the first; only the central portion of the fragment has attracted a little attention by a slight retrograde process.

But the migration of tumor cells into plasmatic medium is not yet observed. The degeneration of cells advances more and more on the third and on the fifth day of preservation, while on the seventh day I can see some spindle-shaped cells wandering out through the plasma, which have appearance and character of the fibroblasts (fig. 14).

Besides them there can also be found some round cells on the margin of the fragment, which may be sarcoma cells, but almost no liquefaction of medium occurs around them.

On the tenth day I can also see many of such cells proliferated into the plasma.

In spite of the further migration of spindle-shaped cells from the explanted piece in chains, the round cells tend to spread out single or in groups near around it.

But these cells are somewhat faded and all their nuclei are pyknotic and rich in vacuoles in their cytoplasma.

The degeneration process has advanced in the specimens of the fifteenth day and there can be seen bad condition of tumor cells only in the periphery of the primitive fragment, and in the central part no living cells are found.

However even on the twentyth day, I was able to see a few pyknotic but living cells on the margin of the old fragment.

§ Characteristic growth of human sarcoma cells.

It has been said that the human sarcomatous tissues are more easily to be cultivated than the human carcinomatous tissues, and in fact some investigators have reported about a successful cultivation of them.

Nevertheless there are almost no detailed description in reference to the characteristic growth of human sarcoma cells in vitro.

However, on the contrary, with regard to that of animal sarcomatous tissue cells, as in animal carcinoma, many investigators, for example, *Lambert*, *Fischer*, *Carrel*, *Burrows*, *Lewis* and *Drew* have observed the characteristic nature of growing sarcomatous cells.

They have concured in their opinions that the sarcomatous tissue grows in conformity to a type which may be regarded as characteristic for tissue of mesenchymal origin and that the growth of sarcoma cells in vitro consists in ameboid wandering into the surrounding plasma, karyokinetic proliferation, and evidences of active metabolism on the part of the cells.

The characteristics of growth in vitro of human sarcoma cells, based upon my investigation, are almost identically with those of the animal.

But even in the human tumors, the spindle-shaped and the round-cell sarcoma cells cultivated in vitro differ essentially in their manner of growth.

Namely the spindle-shaped sarcoma cells migrate single or in form of loose chains into plasma already on the second day of incubation.

If the specimen explanted only on the first day of incubation is examined I was probably able to see some tumor cells passing into the plasma. However it may be, it is sure that the spindle-shaped sarcoma cells wander into plasma in earlier stages of explantation than the carcinoma cells.

Such findings coincide also in the fact that in the culture of the animal sarcoma cells there is practically almost no latent period and they begin to migrate within a few hours after incubation.

Furthermore the human sarcoma cells seem to have a great motility of their own. With regard to this point I have emphasized the ameboid wandering of the cells into plasma.

The cells lying compactly massed in the original piece of tissue, with the normal vascular food supply interrupted, are most unfavorably situated for obtaining nutriment.

It is in response to the demands for food, I think, that the cells migrate into the plasma, which is filled with an abundant nutrient material.

I would point out, that such a great motility shown by growing sarcoma cells, offers a very reasonable explanation of the infiltrative growth of malignant tumors in the body.

The sarcoma cells which passed into the plasma, examined with the high enlargement under the microscope, are all longer than these in the original fragment, and spindle-shaped with the

cytoplasm forming thread-like prolongation from each end, which extends for great distances into the plasma.

These attenuated processes seem usually to terminate in several small prickles. The nuclei are in the middle of the cells, and are ovoid in outline or distinctly fusiform. Typical karyokinetic figures are not common in the growing sarcoma cells.

The liquefaction of plasmatic medium has more or less occurred around the migrating tumor cells and the explanted fragment, so that the new cells can not proliferate further at all and they must then begin to disintegrate gradually.

The cytoplasm of wandering cells exhibits very early small highly refractile droplets, which may be regarded as fat. These droplets increase in number with the age of cells, until the cytoplasm is often literally packed with them. I would regard these granules as an evidence of degeneration.

The round-cell sarcoma differs, as above mentioned, fairly from the spindle-shaped in the manner of growth.

Tho former cells tend even in the first stage of incubation to degenerate and first long latent period, they begin to migrate into the plasmatic medium very slowly.

This probably may be due to the effect of the X-Rays, which was used for treatment, or to the nature of the cells.

These sarcoma cells wandering into plasma present two fairly distinct morphological types. One is long and spindle-shaped and the other is round in outline or irregular in shape.

The former predominates greatly in actively growing cultures and migrates at a distance from the original piece into the plasma.

The latter on the contrary is inferior to the former in his activity and can hardly wander only in the envirous around the original fragment.

I can not understand why such two types of cells are presented in the culture.

It is also impossible to tell in a growing culture of human sarcoma which cells were originally stroma cells and which were sarcomatous.

Since, however, all the cells of the explanted tissue may show the phenomena of growth, the question is one of secondary importance.

Both stroma and sarcoma cells are of mesenchymal origin, and both probably conform to the same type of growth.

In spite of long latent period and degenerative process the tumor cells show their activity is a certain degree even on the twentyth day of explantation.

Serie III. Fibroadenoma from the female breast (case 11).

The original tumor fragments are explanted twenty hours after excision.

The microscopic appearance of the tumor cells on the second day of incubation is almost identically with that of the original uncultivated tumor tissue. Especially the adenomatous cells exhibit the most flourishing condition of life and still carry on their function.

On the third day the activity of these cells is more and more manifested and these lying near the margin of the original fragment grow out luxuriantly and cover the edge of it partially in one seam.

On the fifth day the liquefaction of medium occurs around the explanted piece somewhat severely so that the tumor cells can not further proliferate into the plasma.

Moreover some of the tumor cells in the original fragment show evidently the retrograde process, especially manifested in the fibromatous cell.

But most of the adenomatous cells continue still to regenerate themselves.

On the eighth day the adenomatous cells surrouuding the

surface of the explanted piece have fairly declined, and their nuclei are pyknotic, but few mitotic divisions of these cells are somewhere recognized. In some specimens on the same preservation few long and spindle-shaped cells (fibroblasts) proliferate into the plasma.

On the fifteenth or twentyth day the central portion of the original fragment falls into necrosis and stains almost homogeneously.

Even in this stage of incubation the explant is for the most part covered with degenerated but living cells in one seam (fig. 15).

§ Characteristic growth of the human fibroadenoma cells.

The cultivation of human fibroadenoma cells is perhaps never undertaken up to the present day.

In this observation the fibromatous cells differ remarkably with the adenomatous cells in the manner of growth.

The former is naturally of mesenchymal origin and based upon the present investigations, tends to grow out easily into plasmatic medium. In my cases, however, they are rather degenerative from the first stage of cultivation and finally on the eighth day there can be seen a few fibroblasts wandering into the plasma.

This may probably in part due to the liquefaction of medium and in part to the veil-like cover of the original fragment with the outgrowing adenomatous cells.

But as the fibromatous cells do not show any regenerative processes even in the explant from the beginning of the preservation, there may be some another reasons for that besides that above mentioned.

On the contrary the adenomatous cells exhibit the most flourishing condition of life from the first stage of explantation. They have luxuriantly grown by mitotic division in and out of the

explant.

It is characteristic in the manner of the growth that they never grow single into the plasma, but tend to cover the original fragment continuously in one seam, that is, they show only a superficial growth and not a solid one in the cultures (compare fig. 15).

I think this may surely be the nature of the adenomatous tissue cells.

It is well known that in a gland the regeneration of glandular cells, as in that of epithelia of mucous membranes, takes place only in the fundus. For that reason all the regenerative processes occur less actively in the proliferated cells than in these lying near the fundus.

In some specimens I can see a reasonable secretion produced by the proliferated glandular cells around the explant in the plasmatic medium; what ought to be a direct evidence of cellular function.

Conclusions.

1) The human malignant as well as benign tumor cells, for example, carcinoma, sarcoma and fibroadenoma, are able to be cultured in artificial media.

2) The manner of their growth in vitro conforms with that of animal tumors.

3) The human carcinoma cells grow in sheets or groups, and further they can also migrate single into plasmatic medium by their own motility; their latent periods are nearly three days after incubation.

4) The human sarcoma cells proliferate in general single or in loose chains; the spindle-shaped sarcoma cells can more easily be cultivated in artificial medium than round-cell sarcoma cells.

5) In the cultivation of a carcinoma with myxomatous stroma the tumor cells are different from each other after the kinds of elementary cells in the manner of growth; the epithelial cells exhibit their activity more vigorously than the stroma cells.

6) In the culture of human fibroadenoma cells, the adenomatous cells never grow single into plasma, but spread out in one seam on the surface of the explant and of the liquefied medium. The fibromatous cells can hardly show any signs of regeneration.

7) The liquefaction of plasmatic media occurs more or less around the original fragment or proliferating cells.

8) Therefore the method of tissue cultivation in vitro is also well adapted to the study of human cancerous cells.

Bibliography.

1) **Carrel, A.,** A method for the physiological study of tissues. Journ. of exp. med. Vol. 38, No. 4, p. 407, 1923.
2) **Carrel, A.** and **Burrows, M. T.,** Human sarcoma cultivated outside of the body. Journ. of Americ. med. Ass. Vol. 55 (II), No. 20, p. 1732, 1910.
3) **Carrel, A.** and **Burrows, M. T.,** Cultivation in vitro of malignant tumors. Journ. of exp. med. Vol. 13, No. 5, p. 571, 1911.
4) **Carrel, A.** and **Burrows, M. T.,** Cultivation of tissues in vitro and its technique. Journ. of exp. med. Vol. 13, No. 3, p. 387, 1911.
5) **Carrel, A.** and **Burrows, M. T.,** Cultivation of sarcoma outside of the body. Journ. of Americ. med. Ass. Vol. 55 (II), No. 18, p. 1554, 1910.
6) **Carrel, A.** and **Ebeling, A. H.,** The multiplication of fibroblasts in vitro. Journ. of exp. med. Vol. 34, No. 4, p. 317, 1921.
7) **Craciun, E. C.,** Die Heparin-Plasma-Methode für Gewebskulturen. Arch. f. exp. Zellforsch. Bd. 2, H. 3, S. 295, 1926.
8) **Drew, A. H.,** Cultivation of tissues and tumors in vitro. Lancet. Vol. 204. p. 833, April 21, 1923.
9) **Drew, A. H.,** A comparative study of normal and malignant tissues grown in artificial culture. Brit. journ. of exp. med. Vol. 3, No. 1, p. 20, 1922.
10) **Erdmann, Rh.,** Die biologischen Eigenschaften der Krebszelle nach Erfahrungen der Implantation, Explantation und Replantation. Zeitschr. f. Krebsforsch. Bd. 20, S. 321, 1923.
11) **Fischer, A.,** Tissue culture. London. 1925.

12) **Fischer, A.,** Charaktereigenschaften von Krebszellen in vitro. Klin. Wochenschr. Jg. 7, Nr. 1, S. 6, 1928.

13) **Fischer, A.,** Dauerzüchtung reiner Stämme von Carcinomzellen in vitro. Zeitschr. f. Krebsforsch. Bd. 25, H. 1, S. 89, 1927.

14) **Fischer, A.,** Carcinomzellen und heterologe Systeme in vitro. Zeitschr. f. Krebsforsch. Bd. 25, H. 6, S. 482, 1927.

15) **Fischer, A.,** Studies on sarcoma cells in vitro. (I) Arch. f. exp. Zellforsch. Bd. 1, H. 1, S. 109, 1925.

16) **Fischer, A.,** Studies on sarcoma cells in vitro. (II) Arch. f. exp. Zellforsch. Bd. 1, H. 3, S. 355, 1925.

17) **Fischer, A.,** Studies on sarcoma cells in vitro. (III) Arch. f. exp. Zellforsch. Bd. 1, H. 3, S. 361, 1925.

18) **Fischer, A.,** Studies on sarcoma cells in vitro. (IV) Arch. f. exp, Zellforsch. Bd. 1, H. 4, S. 501, 1925.

19) **Fischer, A.,** Studies on sarcoma cells in vitro. (V) Arch. f. exp. Zellforsch. Bd. 3, H. 4, S. 363, 1927.

20) **Fischer, A.** und **Laser, H.,** Relatives Wachstum von normalen und bösartigen Geweben in vitro. Zeitschr. f. Krebsforsch. Bd. 26, H. 1, S. 80. 1927.

21) **Gaylord, H. R.,** The resistance of embryonic epithelium, transplantable mouse cancer, and certain organisms to freezing with liquid air. Journ. of infect. diseases. Vol. 5, p. 443, 1908.

22) **Lambert, R. A.,** Technique of cultivating human tissues in vitro. Journ. of exp. med. Vol. 24, No. 4, p. 367, 1916.

23) **Lambert, R. A.,** Tissue culture in the investigation of cancer. The journ. of cancer-research. Vol. 1, No. 2, p. 169, 1916.

24) **Lambert, R. A.,** Comparative studies upon cancer cells and normal cells. Journ. of exp. med. Vol. 17, No. 5, p. 499, 1913.

25) **Lambert, R. A.** and **Hanes, F. M.,** Characteristics of growth of sarcoma and carcinoma cultivated in vitro. Journ. of exp. med. Vol. 13, No. 5, p. 495, 1911.

26) **Lambert, R. A.** and **Hanes, F. M.,** The cultivation of tissue in plasma from alien species. Journ. of exp. med. Vol. 14, No. 2, p. 129, 1911.

27) **Lambert, R. A.** and **Hanes, F. M.,** Amöboide Bewegungen von Krebszellen als ein Faktor des invasiven und metastatischen Wachstums maligner Tumoren. *Virchow*'s Arch. Bd. 209, S. 12, 1912.

28) **Lambert, R. A.** and **Hanes, F. M.,** A comparison of the growth of sarcoma and carcinoma cultivated in vitro. Proc. of the soc. for exp. biol. and med. Vol. 8, p. 59, 1911.

29) **Lewis, W. H.** and **Gay, G. O.,** Clasmatocytes and tumor cells in cultures of mouse sarcoma. Bull. of Johns Hopkins hospital. Vol. 34, No. 393, p. 369, 1923.

30) **Losee, J. R.** and **Ebeling, A. H.,** The cultivation of human tissue in vitro. Journ. of exp. med. Vol. 19, No. 6, p. 593, 1914.

31) **Losee, J. R.** and **Ebeling, A. H.,** The cultivation of human sarcomatous tissue in vitro. Journ. of exp. med. Vol. 20, No. 2. p. 140, 1914.

32) **Ribbert, H.,** Über das Gefässsystem und die Heilbarkeit der Geschwülste. Dtsch. med. Wochenschr. Jg. 30, Nr. 22, S. 801, 1904.

33) **Salvin- Moore, J. E.,** Note upon the effect of liquid air upon the graftable cancer of mice. Lancet, Vol. 1, p. 227, 1908.

34) **Thomson, D.** and **Thomson, J. G.,** The cultivation of human tumor tissue in vitro. Proc. of Roy. soc. of med. Vol. 7 (I), p. 7, 1913–1914.

Description of Plates.

Plate VI

Fig. 1. Case 13, carcinoma with myxomatous stroma removed from a man's neck. 20 days after explantation. The cancer cells proliferate into the plasmatic medium in form of chains.
Photomicrogram; Obj. 16 m.m., Homal I of Zeiss, camera length 15 c.m.

Fig. 2. Case 8, carcinoma of a female breast; at third day of incubation. The cancer cells of a small alveoli and endothelial cells of blood capillaries begin to proliferate.
Photomicrogram; Obj. 8 m.m., Homal I of Zeiss, camera length 22 c.m.

Fig. 3. Case 9, adenocarcinoma of female breast, on the third day of incubation. The adenoma cells show mitotic pictures.
Photomicrogram; Obj. 8 m.m., Homal III of Zeiss, camera length 25 c.m.

Plate VII

Fig. 4. Case 10, carcinoma of a female breast, on the fifth day of incubation. The proliferated cancer cells are grouping also in alveoli.
They show characteristics of the medullary cancer on one hand but also of squamous epithel on the other hand.
Photomicrogram; Obj. 8 m.m., Homal III of Zeiss, camera length 30 c.m.

Fig. 5. Case 17, carcinoma of tongue, on the third day of incubation. The large round cancer cells are proliferated at the margin of the original fragment. Some of them enter already the surrounding plasmatic medium. One of them shows mitotic pictures.

Photomicrogram; Obj. 8 m.m., Homal III of Zeiss, camera length 40 c.m.

Fig. 6. The same case on the fifth day of incubation. The cancer cells invade the plasmatic medium in form of a long chain.
Photomicrogram; Obj. 8 m.m., Homal III of Zeiss, camera length 30 c.m.

Plate VIII

Fig. 7. Case 16, carcinoma of oesophagus from a cadaver, on the third day of incubation. Some of the long spindle-shaped cancer cells invade the surrounding plasmatic medium.
Photomicrogram; Obj. 8 m.m., Homal III of Zeiss, camera length 45 c.m.

Fig. 8. The same case on the fifth day of incubation. Nearly the same picture. The cancer cells have very much elongated themselves.
Photomicrogram; Obj. 8 m.m., Homal I of Zeiss, camera length 16.5 c.m.

Fig. 9. Case 18, carcinoma of thyroid gland on the third day of incubation. Some cancer cells have already wandered out into the surrounding plasmatic medium but their connection with the original fragment has been interrupted through the liquefaction of the medium.
Photomicrogram; Obj. 8 m.m., Homal I of Zeiss, camera length 30 c.m.

late IX

Fig. 10. Case 14, carcinoma of rectum, on the seventh day of incubation. A cancer cell group invades the surrounding medium. Photomicrogram; Obj. 8 m.m., Homal III of Zeiss, camera length 30 c.m.

Fig. 11. The same case on the same date of incubation. A cancer cell group invades wider the surrounding medium as in fig. 10.
Photomicrogram; Obj. 8 m.m., Homal III of Zeiss, camera length 33 c.m.

Fig. 12. Case 12, spindle-shaped cell sarcoma of the palate, 48 hours after explantation. The sarcoma cells have already wandered out into the surrounding plasmatic medium which, however, is liquefied around each sarcoma cell or cell group.
Photomicrogram; Obj. 8 m.m., Homal III of Zeiss, camera length 28 c.m.

Plate X

Fig. 13. The same case as in fig. 12, on the third day of incubation. The sarcoma cells are proliferated very abundantly; the liquefaction of the medium at margin is very evident.

Photomicrogram; Obj. 16 m.m., Homal I of Zeiss, camera length 23 c.m.

Fig. 14. Case 21, round cell sarcoma of the neck, on the seventh day of incubation. The proliferated cells in the original fragment are pretty polymorphous.
Photomicrogram; Obl. 8 m.m., Homal III of Zeiss, camera length 35 c.m.

Fig. 15. Case 11, fibroadenoma of a female breast, on the twentyth day of incubation. Not only the margin of the original fragment but the margin of the liquefied medium is covered by the new proliferated adenoma cells.
Photomicrogram; Obj. 8 m.m., Homal III of Zeiss, camera length 18 c.m.

PLATE VI.

Fig. 1

Fig. 3

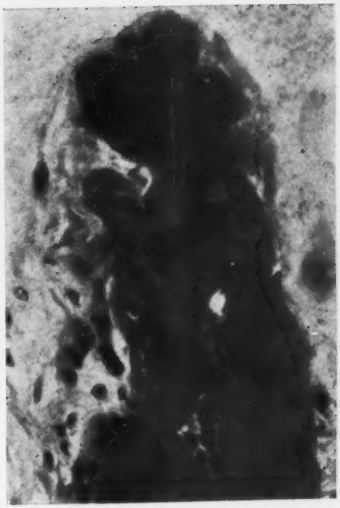
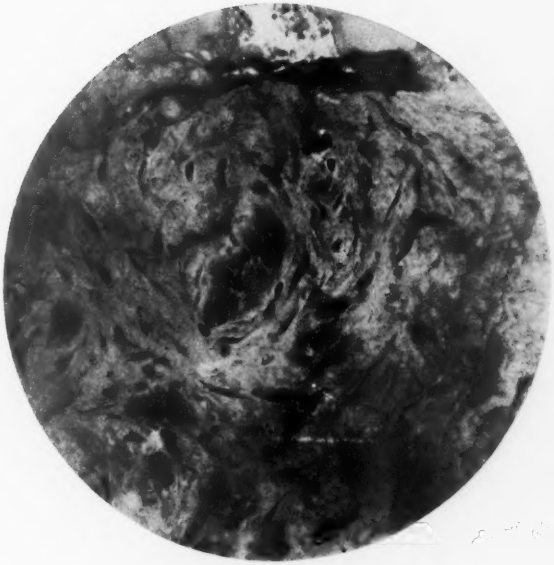


Fig. 2



S. Kikuchi, Cultivation of the Human Tumors in vitro.

PLATE VII.

Fig. 4

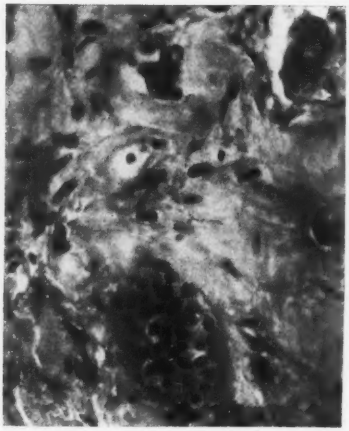


Fig. 6

Fig. 5

S. Kikuchi, Cultivation of the Human Tumors in vitro.

PLATE VIII.

Fig. 7

Fig. 8

Fig. 9

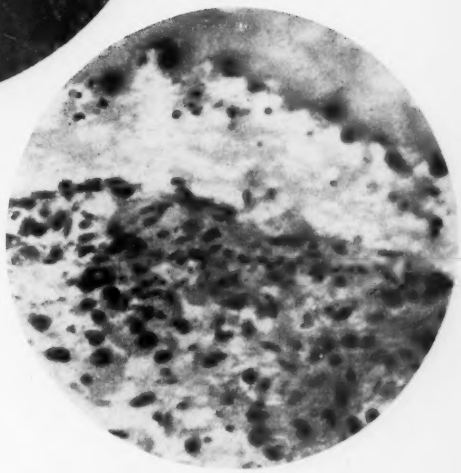


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PLATE IX.

Fig. 10

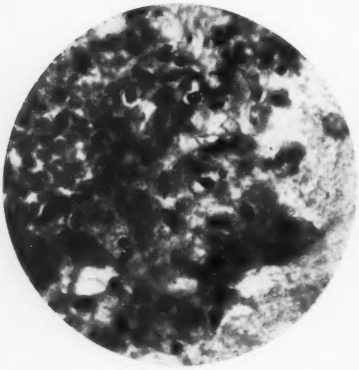

Fig. 11

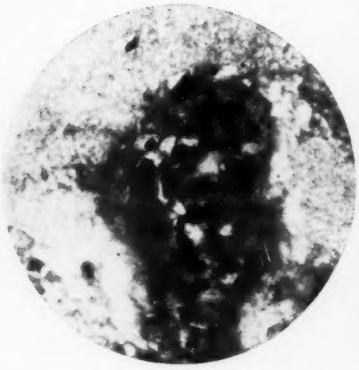

Fig. 12

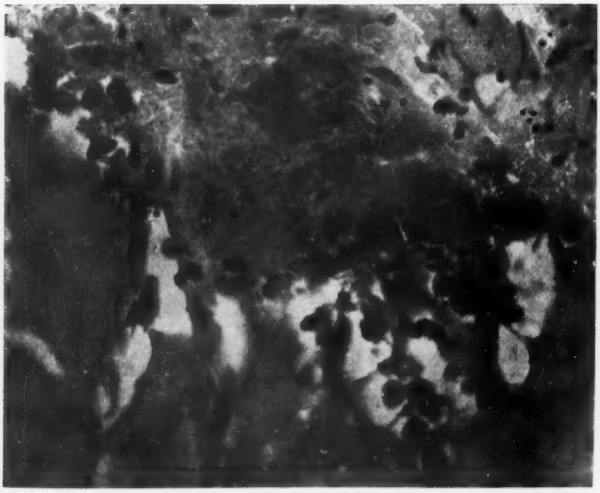

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PLATE X.

Fig. 13

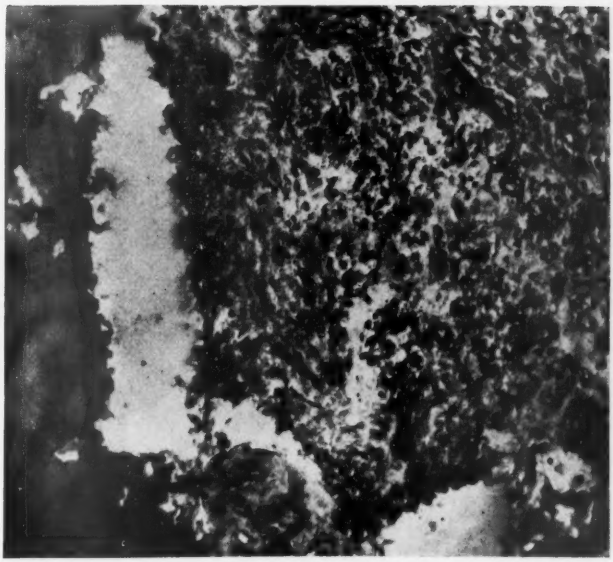


Fig. 14

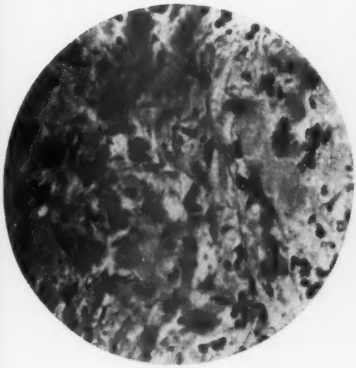
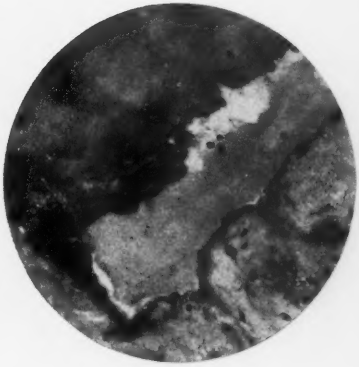


Fig. 15



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Abstracts.

Contribution of the Pathology of Heterotransplantation of Tumor. A Duck Sarcoma from Chicken Sarcoma.

By

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The present report forms a sequel of the Report of last year (*Fujinami* and *Suzue*, "Contribution of the Pathology of Tumor Growth. Experiments on the Growth of Chicken Sarcoma in the Case of Heterotransplantation".),*) and deals only briefly with some of the results obtained since the previous Report was made.

I.

Heterotransplantation of tumor usually yields negative results. All of our experiments in the heterotransplantation of chicken sarcoma to ducks had been until last year as unsuccessful as similar experiments made by other investigators, when we had the satisfaction of obtaining positive results. When these positive results were reported upon last year, however, our investigations had not yet extended beyond the 5th–6th generations. As it often happens that tumors growth ceases in a few generations after heterotransplantation of tumor has temporarily shown positive results, we were at the time rather doubtful

*) Transactions of the Japanese Pathological Society. Vol. XVIII, p. 616. 1928.

whether the positive results then secured would prove permanent. For this reason, we took care to note in our previous Report: "If its ability to be transplanted and to grow so largely continues for the future, we shall clearly recognize the existence of such a chicken sarcoma that can be adapted perfectly to duck", and also "then it can be said that we have succeeded in transmuting a transplantable chicken sarcoma (myxosarcoma) into a transplantable duck sarcoma". The experimental investigations which we have carried on during the past year, however, established the success of this heterotransplantation. All experiments that have subsequently been made in sarcoma transplantation from duck to duck have invariably produced positive results, and the ratio of positive transplantation was almost 100 per cent. The growth of the implanted tumor was also very active and rapid. Again, the figure of tissue morphology and character accorded almost always with that of the original tumor (though on rare occasions some slight difference occurred). Furthermore, it was found that this tissue develops necrosis less marked as compared with the tumor of chickens. The fact that practically all ducks bearing implanted sarcoma get emaciated and die testifies conclusively to the successful transplantation of malignant tumor.

Inasmuch as implanted sarcoma makes particularly speedy growth in the body of the duck, transplantations could be effected in rapid succession, and up to the present since January last year, forty generations have already been experimented upon. Moreover, the results so far obtained show no sign of impaired vitality, and so it is believed that transplantation can be continued permanently with as much success as hitherto.

Thus we have secured the transplanted tumor in the shape of duck sarcoma converted from chicken sarcoma.

This duck sarcoma could be transplanted not only to young ducks but to full-grown ducks also, with the same measure of

success. It is true that some slight difference was observable in the degree of growth, but in both cases of transplantation the growth of tumor was active.

The ratio of successful transplantation to duck is, as already mentioned, nigh upon 100 per cent., but as in the case of chickens, we came across (though on rare occasions!) ducks which were found to be immune from transplantation. Of about 150 ducks (exclusively used for grafting purposes) only two were found to possess this immunity. Repeated attempts to transplant on these two ducks failed to secure the growth of tumor.

This duck tumor can easily be re-transplanted into chickens, a fact which was mentioned in our previous Report. Experiments subsequently conducted, showed that this re-transplantation can be effected with as good a result even when the duck tumor used is generations old. Thus, it can fairly be asserted that we have succeeded in obtaining "tumor common to chickens and ducks". A comparative study of the morphology and biology of the tissue of transplanted sarcoma in these two different species of birds is of considerable interest, but we will here refrain from describing the results of such a study.

The growth of duck sarcoma is rather more active and rapid than that of chicken sarcoma. In some cases, it grows as big as a hen's or a goose's egg in ten days after transplantation. By the time a young duck succumbs to growing tumor, the implanted tumor within pectoral muscle often attains the size of a goose's egg, or even of a fist in some exceptional cases. In ordinary cases, however, no marked necrosis is yet formed then in sarcoma tissue. Whether this character of the tissue will be preserved in future transplantation generations, or whether it will undergo some changes will constitute one interesting subject of study in the biological history of this transplantable tumor.

Ducks bearing implanted sarcoma are short-lived. In case young ducks get implanted tumor formed on both sides of breast,

they generally die in ten to fourteen or fifteen days' time. In the case of full-grown ducks, which get implanted tumor formed on one side of the breast, they get so emaciated that they are driven to the brink of death in a little over twenty days' time.

It is clearly noticeable that, in the case of ducks, the metabolism of the body is adversely affected by the growth of implanted sarcoma. One phenomenon worthy of particular attention was that the spleen of ducks, unlike that of chickens, showed remarkable swelling, though there were some exceptions. (With regard to this swollen spleen, Dr. *Saijo*, of our Laboratory, has made his study, and it is expected that he will have occasion to write on it. In organs others than the spleen may also occur degenerative tissue metamorphoses indicative of an anomalous metabolism, for instance in the liver.)

Notwithstanding the fact that duck tumor witnesses a very active and rapid growth, no instance of metastasis has come under our observation up to the present. This fact may partly be due to brief term of existence of such animals.

Now, we see that chicken sarcoma can be converted into perfect duck sarcoma by means of transplantation, and this tumor is endowed with a character common to both kinds of birds. This knowledge renders to the study of the biological relations between this sarcoma tissue and the body of the chicken, on one hand, and that of the duck, on the other, a considerable interest. Thus, many interesting themes are supplied that can be enunciated by extraneous tissue culture and various other biological researches. (See the essays by *Sumikoshi* and *Kusaka*.)

The heterotransplantation of tumor from chickens to ducks under review is ordinarily caused by the proliferation of the cells of implanted sarcoma themselves.

II.

There are some points worthy of special note in connection with the heterotransplantation of tumor.

Even when the heterotransplantation of tumor ends in negative results, the implanted sarcoma cells do not always die immediately. They can, in some cases, even be fostered for a certain period and to a certain extent. Special care is, therefore, needed before passing the final pronouncement that heterotransplantation has produced positive results. The heterotransplantation of sarcoma — malignant tumors in particular — cannot be safely pronounced positive unless the proliferation of the cells of implanted tumor tissue goes on continuously and the tumors keep on growing as actively and steadily as before, with the result that the health of the animal concerned is considerably impaired. Judged by this standard, our transplantation of chicken sarcoma to ducks may rightly be pronounced „ malignant tumor ".

In order to establish the fact that even in the case of heterotransplantation which is bound to end in negative results, tumor tissue or tumor cells contained in grafts can preserve for a certain space of time their capacity for transplantation, we have made experiments with chicken sarcoma in regard to both mammals and cold blooded animals. One would be inclined to believe that chicken tissue (tumor tissue) inoculated in the bodies of animals belonging to classes entirely different from the feathered tribe would immediately die, but this is not necessarily the case.

(A) The mammals used in these experiments were guinea-pigs and rats, and the experiments were repeated several times on a number of such animals. Minced pieces of chicken sarcoma were first inoculated beneath the skin of these animals, and then after a lapse of time of varying duration, (eight, eleven, and eighteen days in the cases of guinea-pigs)

the inoculated tumor material was taken out, re-implanting it subcutaneously or intramuscularly into healthy chickens. The tissue of implanted material extracted in this way was, judging from the outward appearance, either in the state of necrosis or falling into such a state. Our experiments in the re-implantation of inoculated tumor material into chickens led but to negative results in most cases, as we had anticipated, but in the case of two guinea-pigs, in which pieces of chicken sarcoma remained inoculated for eleven days, positive results were obtained in two places. The same experiments in regard to rats (six, nine, twelve, and fifteen days) brought comparatively many positive results. To be more exact, unmistakable myxosarcoma developed in two places of two chickens (which were also all the places where re-implantation was made) in the six-day cases, in two places of one chicken (which were also all the places of re-implantation) in the nine-day case, and in one place of one chicken (one of three places of two chickens) in the fifteen-day cases.

(B) In our experiments in regard to cold blooded animals, we, Dr. *Ogi* and myself (*Fujinami*), used toads, and our experiments were made in different seasons of the year, as the bodily metabolism of the toad varies according to seasonal conditions. The experimental methods employed were the same as already described. First, minced pieces of chicken sarcoma (sometimes duck sarcoma) were inoculated plentyful under the skin of toads, and then these animals were killed after a varying lapse of time, so as to extract from their bodies the sarcoma pieces inoculated previously and to re-implant them under the skin of healthy chickens (or domestic ducks). The sarcoma pieces inoculated into the bodies of toad were found, on the whole, to retain their formerly external appearance for a comparatively long time. Especially in the experiments made in the cold season it was found that sarcoma pieces inoculated over thirty days before showed the appearance of fresh material. We carried out the

re-implantation of 6-day, 10-day, 11-day, 15-day, 25-day, 33-day and 35 day-old inoculated sarcoma pieces, and obtained in unexpectedly many cases positive results. For instance, the experiments in May and July in 6-day-old ones brought positive results each time (two out of three chickens experimented upon), and two-thirds of the experiments in 10-day-old and 11-day-old ones also, yielded similar results (in two places in two chickens out of three places in three chickens). But the experiments in 15-day-old and 25-day-old ones (made in June and July) — which were, by the way, only few in number — brought negative results. Again, in the experiments conducted in the cold season of January and March in 33-day-old and 35-day-old ones, grafts clearly showed positive results in seven out of eight places in five chickens into which re-implantation was made, and in all cases the growth of sarcoma was good.

From the above-mentioned experimental results, it may be concluded that although the chicken sarcoma tissue transplanted to a cold blooded animal (toad), which belongs to a class zoologically entirely different from a chicken, does of course not, grow permanently in the body of such an animal, it by no means dies immediately. As a matter of fact, it can retain its capacity for transplantation for a comparatively long time. The same may be said of the transplantation of chicken sarcoma tissue to mammals such as guinea-pigs and rats.

III.

What aroused our interest all the more in connection with experiments with toads, concerns the distribution and presence in the body of what we mentioned in a previous Report as "tumor producing agent" (see our Report of 1925), This new fact came to light in the course of the experiments which I carried out with Dr. *Ogi*. About the same time

that we experimented on toads, we conducted similar experiments on birds (pigeons) and mammals (guinea-pigs and rats). Our experiments with pigeons consisted, as we had occasion to make a few remarks in our previous Report, in extracting lung tissue from the birds into which chicken sarcoma had been implanted and in inoculating minced pieces of this tissue into the body of healthy chickens. The result was that only in a few cases the development of myxosarcoma tissue was witnessed. Similar experiments were subsequently made with regard to guinea-pigs and rats. The transplantation of lung tissue of guinea-pigs failed to produce any positive results, while in the case of the lung tissue pieces (spleen pieces were also used) of rats, they developed myxosarcoma, though not very briskly, only in one place out of eighteen places in eleven chickens where they had been implanted. In these experiments, sarcoma was taken out of a chicken bearing it, and minced pieces of it were inoculated beneath the skin of rats. Then, fifteen days afterwards, the lungs were extracted from these rats, and lung tissue pieces were implanted into chickens subcutaneously.

With toads, experiments of this kind produced rather favourable results. Toads bearing chicken sarcoma pieces implanted plentifully under their skin were killed after varying periods of time, and then the lungs, livers and spleens were taken out very carefully, implanting the minced pieces of these organs either beneath the skin or in the pectoral muscle of healthy chickens. We can affirm than in extracting the organs from toads, we most scrupulously avoided touching either the pieces of the chicken sarcoma previously inoculated beneath their skin or the region containing them. In these experiments, the lung tissue pieces of the toads, into which the pieces of chicken sarcoma had been implanted five and six days previously, were implanted into six healthy chickens in fourteen different places. Of these, myxosarcoma clearly developed in four chickens in nine places,

and this sarcoma proved to be transplantable to other chickens. In other experiments with toads bearing chicken sarcoma pieces of older inoculation, that is, nine days, eleven days, fifteen days, and twenty-one days, no case has so far come under our notice which can be confidently pronounced as showing positive results, but in one solitary instance (a 15-day case) the results obtained were somewhat positive.

The above-mentioned results may at first sight seem strange, but there is no room what so ever for doubting their authenticity. We already reported in 1925, that when the tissue of the organs (which show no outward sign of abnormality) containing "tumor producing agent", which is distributed in the regions other than the tumor-affected portion of the body of a chicken bearing chickensarcoma, presumably through blood circulation, is implanted into healthy chickens, the same kind of tumor develops at the spot of implantation, and that if simple granulation tissue or artificially caused inflammatory spots are created in any portion of the body of a chicken bearing sarcoma, "tumor producing agent" operates there (probably through the intermediary of blood circulation) and often results in the formation of the same kind of sarcoma. Our new experiments, have furthermore, established the fact that this "tumor producing agent" can be made to be so distributed and retained not only in the organs of chickens, ducks or other birds belonging to the same zoological class, but also in the organs of animals of other classes, such as mammals (rats, for instance) and cold blooded animal (toads).

Whether this "tumor producing agent" represents tumor themselves, or whether it embodies a specific kind of microorganism or whether it is some peculiar substance developing out of tumor cells was a matter which called for some attention in our experiments, but as no exclusive results have yet been secured, we will refrain from any reference to our research in this respect in the present Report.

On the Relation between the Cancer Morbidity and the Blood types, with reference to the Disposition of the Cancer

By

Dr. **Hideo Terada.**

(From the Pathological and Bacteriological Institut, Medical College, Keio University, Tokyo.)

I have tried to examine the types of the blood of cancer patients, the relation to that of healthy persons being taken into the consideration. The result obtained is as follows:

The types of blood.	O	A	B	AB	Total
The number of cancer patients examined.	23. (21,1%)	47. (43,1%)	25. (22,9%)	14. (12,8%)	109

According to the frequence of the morbidity of cancer, the blood types are to be classified as follows: A — B — O — AB. It must be an important fact that the order above described differs from that determined by the examination of healthy persons from the same view point. Being calculated from the total number (3097) reported by Dr. *Shirai*, Dr. *Nakajima*, etc., the order of the blood types is as follows:

A (38,42%) — O (31,29%) — B (21,02%) — AB (9,27%).

As easily to be seen, the order of the blood types of cancer patients is distinguished from that of healthy persons by two factors, i. e. 1) by the considerable increase of the percentage in the type A, 2) by the remarkable decrease of the percentage in the type O, while it is nearly equal in the type B.

It is a curious fact that the cancer holds the choice for the blood types or the property of the blood, i. e. it likes the type A to the utmost and hates the type O to the last degree.

It is generally believed that the genesis of cancer takes place by the coexistence both of the external and the internal causes, as with other diseases. But the term "internal cause" expresses simply an abstract idea and there is no clear scientific explanation form the stand point based on reliable facts.

According to the facts which I have learned the internal cause of the cancer, i. e. the so-called disposition on the cancer is to be considered as it is interwoven with the properties of the blood or it holds some close interrelationship with it. Now, since the types of the blood should be an expressions of the chemical or the physical or the physico-chemical property of the blood, the disposition to the cancer would consequently be a process or condition of chemical or physical or physico-chemical nature. From this view point, my report may be the first to throw some light into the darkness of the concept of the so called "disposition".

The relation between cancer mortality and blood types in various districts in Japan as well as in various foreign countries was also considered and the same relationship was found.

(Abstracted by the Author.)

社團法人 癌研究會趣旨

近時ニ於ケル自然科學ノ進運ハ顧ル著シキモノアリ、從ツテ其基礎ノ上ニ立テル醫學ニ在リテモ研究益々精ヲ加ヘ緻ヲ極ムルニ至レリ、扨ニ於テカ從來ノ醫學的研究ガ多ク分科的ニシテ、同一疾病ノ調査ニ當リテモ各自已專門的見知ヨリ互ニ相離レテ其作業ニ從ヒ各方面ノ多數學者ガ提携シテ協同研究スルガ如キハ顧ル稀レナリシニ反シ現代ニ於ケル學會ノ進運ハ此從來ノ研究方法ト共ニ共同的研究ノ緒モ亦自ラ開カル、ヲ見ルニ到レリ癌ノ協同的研究ノ如キ其一例ナリ。

古來宇內ノ隨所ニ見ラレ甚ダ酸鼻ナル難治ノ疾患タル癌ハ統計ニ徵スルニ之ガ爲メニ命ヲ致スモノ年々其數ヲ增加スルノ傾アリ、サレバ泰西ノ研究家ハ久シキ以前ヨリ其疾患ノ本態ヲ究メント企圖シ國家竝ニ社會モ亦之ヲ奬勵シ其研究ニ向テ多大ナル援助ヲ與フルノ例甚ダ尠ナカラザルナリ、然モ未ダ尚其眞相ヲ捉フルコトヲ得ザルハ痛恨之ニ過ギズト謂フベシ、抑モ癌ナル疾患ハ內科、外科、其他各方面ノ臨牀醫學科ニ於テ扱ハレ其研究ハ解剖組織學的事項ノ外化學的竝ニ生物學的事項ニ亙リ甚ダ廣汎ナル領域ヲ占ムルハ既ニ知ラルル所ナリ故ニ歐米諸國ニ於テハ夙ニ癌ノ如キ大問題ハ學者ノ孤立的研究ヲ以テハ到底其ノ本態ヲ闡明スル期ナキモノナルコトヲ悟リ各方面ノ學者相倚リテ其ノ協同研究ヲ遂ゲンコトヲ企テ特ニ癌研究會又ハ癌調査會ナルモノヲ設ケ完備セル研究設備ノ下ニ上記各方面ノ研究ヲ分擔セシメントシテ研究ノ步武ヲ進メ來リシガ更ニ數年前主トシテ獨逸國學者ノ主唱ニヨリ國際癌研究協會開設セラレ爾來各國ノ研究團體互ニ聯絡ヲ保チ之ガ研究ヲ進メントスルニ至リ我邦學者ニ向テモ先年斯ノ如キ意味ヲ以テ此國際的共同研究ニ加盟センコトヲ慫慂シ來レリ、蓋シ我邦ノ如キハ歐米各國ニ比シ風土竝ニ生活、慣習、體質等ニ著シキ差異アルヲ以テ本邦研究者ノ之レニ加リテ此研究ヲ積ムノミニテモ或ハ比較研究上望外ノ結果ヲ齎シ貢獻スルコト尠カラザルベク且ツ我國ニ於テモ年々本病ノ爲メニ鬼籍ニ登ルモノ數萬ヲ下ラザルガ故ニ國家的ニモ亦其研究ハ忽諸ニ附スルコト能ハザルモノアリ、サレバ本邦ニ於テモ上記世界ニ於ケル現代醫學ノ趨勢ニ順ヒ又一面人類ノ福祉ヲ增進セシメンガ爲メニ特ニ國際的性質ヲ有スル癌研究會ヲ設立シ、特殊ノ設備ヲ有スル研究所ヲ附屬シ癌研究ノ中央機關タラシメ、又同時ニ治療所ヲ設立シ最新ノ研究結果ヲ應用實驗スルハ實ニ國際的時運ノ風潮ニ鑑ミ科學近時ノ發達ヲ移シテ人類ノ幸福ヲ增進スル上ニ於テ刻下ノ緊要ナル事業タルヤ明ナリ、之本會ノ設立ヲ企テ國際癌研究會ニ加盟シタル理由ナリ。

第十八條 本會ニ左ノ役員ヲ置ク

總　裁　一　名　副總裁　二　名以内
會　頭　一　名　副會頭　二　名以内
理　事　十　名以内（内理事長一名）
監　事　三　名以内　評議員會長　一　名
評議員副會長　一　名　評議員　若干名

第十九條 本會ハ皇族ヲ推戴シテ總裁トス
副總裁ハ總會ニ於テ之ヲ推戴ス
會頭、副會頭ハ會員中ヨリ總會ニ於テ之ヲ選擧ス
理事長、理事、監事、評議員ハ會頭ノ推薦ニ由リ總裁之ヲ囑託ス、但監事ハ他ノ役員ヲ兼ヌルコトヲ得ス
評議員會長、評議員副會長ハ評議員中ヨリ互選ニヨリ選擧ス

第二十條 會頭、副會頭、理事長、理事、監事、評議員ノ任期ハ二箇年トス、但滿期再選又ハ再囑スルコトヲ得

第二十一條 會頭、副會頭、理事長、理事及監事ニ缺員ヲ生シタルトキハ補缺選擧又ハ囑託ヲナスコトヲ得、補缺員ノ任期ハ前任者ノ殘期間トス

第二十二條 會頭ハ本會ヲ總理シ且ツ總會ノ議長トナル
副會頭ハ會頭ヲ輔佐シ會頭事故アルトキハ之ヲ代理ス

第二十三條 評議員ハ本會樞要ノ事項ヲ評議ス

第二十四條 理事長ハ本會一切ノ會務ヲ處理ス
理事長事故アルトキハ他ノ理事代テ其職務ヲ行フ

第七章　會議

第二十五條 總會、評議員會ハ東京ニ於テ之ヲ開ク、但時宜ニ依リ變更スルコトヲ得

第二十六條 定期總會ハ毎年四月之ヲ開ク、但開會期ハ時宜ニ依リ變更スルコトヲ得

第二十七條 總會ノ招集ハ會報又ハ新聞若クハ通知書ニ依ツテ之ヲ行フ

第二十八條 總會ノ決議ハ出席會員ノ過半數ヲ以テ之ヲ決ス

第二十九條 評議員會ハ必要ニ應シ會頭之ヲ招集ス

第八章　雜則

第三十條 本會ハ必要ニ應シ支會ヲ設クルコトヲ得
支會ニ關スル規程ハ評議會ノ決議ヲ經テ別ニ之ヲ定ム

第三十一條 本會ニ書記若干名ヲ置ク
書記ハ上長ノ命ヲ受ケ庶務會計ノ事務ニ從事ス
書記ハ會頭之ヲ任免ス

第三十二條 削除

第三十三條 會誌癌ハ毎年四回之ヲ發行シ無料ヲ以テ會員ニ頒布ス

第三十四條 本定款ノ變更ハ總會ニ於テ出席會員三分ノ二以上ノ同意ヲ得ルコトヲ要ス

以　上

東京市本鄕區本富士町二番地
社團法人 癌研究會

社團法人 癌研究會定款

明治四十一年四月設立
大正三年二月法人登記
大正三年十一月改正
大正六年四月改正
大正十一年四月改正
昭和四年五月改正

第一章 目的及事業

第一條 本會ハ癌ニ關スル研究及研究ノ奬勵ヲ爲シ、又ソノ豫防、撲滅ヲ計ルヲ以テ目的トス

第二條 本會ハ前條ノ目的ヲ達スル爲メ癌研究所、癌治療院ヲ設立シ又ハ學術集談會ノ開催、優秀業績ヘノ授賞、會誌ノ發行、研究費ノ補助竝ニ癌ニ關スル豫防知識ノ普及等ノ實行ヲ期ス

第二章 名稱

第三條 本會ハ社團法人癌研究會ト稱ス

第三章 事務所

第四條 本會ハ事務所ヲ東京市本郷區本富士町二番地ニ置ク

第四章 資産

第五條 本會ノ資産ハ左ノ如シ

一、癌研究會ヨリ引繼キタル資金
二、寄附金
三、會員ノ會費
四、前項以外ノ諸收入金

第六條 本會ハ前條資産ノ一部ヲ基本金トナスコトヲ得

第七條 基本金ハ評議員會ノ決議ヲ經ルニ非サレハ處分スルコトヲ得ス

第八條 本會ノ資産ハ有價證券ヲ買入レ又ハ郵便官署若クハ確實ナル銀行ニ預ケ入レ之レヲ保管ス
但場合ニ由リテ評議員會ノ決議ヲ經テ不動産ヲ買入ルルコトヲ得

第九條 本會收支ノ決算ハ翌年ノ定期總會ニ於テ之ヲ報告スヘシ

第十條 本會ノ會計年度ハ毎年一月一日ニ始マリ十二月三十一日ニ終ルモノトス

第五章 會員

第十一條 本會ノ目的ヲ贊成幇助スル者ハ理事會ノ同意ヲ得テ會員タルコトヲ得

第十二條 會員ヲ分チテ左ノ三種トス

一、名譽會員　一、特別會員　一、通常會員

第十三條 名譽會員ハ本會ノ事業又ハ學術上特ニ功績アル者及ヒ本會ニ金壹千圓ヲ寄附シタル者ニ就キ評議員會ノ決議ヲ經テ會頭之ヲ推薦ス

第十四條 特別會員ハ會費トシテ一時ニ金百圓以上ヲ納ムルモノトス

第十五條 通常會員ハ會費トシテ毎年金五圓ヲ納ムルモノトス

第十六條 會員タラント欲スル者ハ其ノ氏名、住所ヲ記シ本會事務所ニ申込ムヘシ

第十七條 退會セント欲スル者ハ其旨本會事務所ニ届出ツヘシ

第六章 役員

癌

第二十三年第三册　昭和四年八月刊行

原著

腫瘍ノ異種移植。家鴨肉腫トナレル家鶏肉腫。家鶏及ビ家鴨ニ共通ノ腫瘍

「第二十一回癌研究會學術集談會（昭和四年）ニ於ケル演說」

京都帝國大學醫學部病理學教室

藤浪鑑

波多野輔久

本篇ハ昨年報告（藤浪、鈴江。腫瘍ノ續發性增殖ニ關スル病理ノ補遺、異種動物體ニ於ケル家鶏肉腫組織增殖）ノ續稿デアッテ、玆ニハ、前報告以後ニ獲タ新所見ノ一部分ヲ簡單ニ述ベルニ止メル。

上

異種動物ヘノ腫瘍移植ハ、其成績陰性ヲ示スノガ普通デアル。家鴨ヘノ家鶏肉腫移植ハ、私共モ他ノ研究者ト同ジク、是迄イツモ不成功ニノミ終ッタ。トコロガ、昨年始メテ陽性成績ガ擧ゲ得ラレタ。但昨年報告ノ時ニハ、唯第五乃至六代

總裁
伏見宮博恭王殿下

副總裁
子爵 澁澤榮一

會頭
醫學博士 長與又郎

副會頭
醫學博士 稻田龍吉

理事長
醫學博士 鹽原廣重

理事
同 醫學博士 男爵 高木憲次
同 醫學博士 木村德衛
同 醫學博士 磯村豐太郎
同 醫學博士 佐々木隆興
同 醫學博士 南大曹
同 醫學博士 宮川米次
同 醫學博士 男爵 澁澤敬三
同 醫學博士 男爵 森村市左衛門
同 評議員 醫學博士 井上準之助
同 評議員 醫學博士 今村繁三
同 醫學博士 磐田龍雄
同 醫學博士 稻垣長次
同 醫學博士 今村豐太郎
同 醫學博士 池田成彬
同 醫學博士 林春雄
同 醫學博士 服部金太郎
同 醫學博士 八田善之進
同 醫學博士 西山信直
同 獸醫學博士 仁田勇
同 醫學博士 西野忠次郎
同 醫學博士 細田五郎
同 醫學博士 土肥慶藏
同 醫學博士 遠山郁三
同 醫學博士 大緒方知一郎
同 醫學博士 岡田和一郎

評議員
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醫學博士 大橋新太郎
醫學博士 川上添道
醫學博士 門野重九郎
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醫學博士 吉本清太郎
醫學博士 高橋信次郎
醫學博士 高野寬六郎
醫學博士 高木喜寬
醫學博士 田代義德
醫學博士 男爵 鶴田禎次郎
醫學博士 都築正男
醫學博士 長與又郎
醫學博士 中島久萬一郎
醫學博士 南條金雄
醫學博士 吳秀三
醫學博士 柳田利太郎
醫學博士 矢野恒太
工學博士 牧山耕藏
醫學博士 山田準次郎
醫學博士 山本留次郎
醫學博士 極勝三郎
醫學博士 山田嵐次郎
醫學博士 增福田政義
醫學博士 二木謙吾
醫學博士 小金井良精
醫學博士 男爵 近藤次繁

評議員
醫學博士 有賀長雄
醫學博士 赤司鷹一郎
醫學博士 朝倉文夫
醫學博士 雨宮敬次郎
醫學博士 青山德藏
醫學博士 青木菊雄
醫學博士 阿部多久三郎
醫學博士 佐藤三吉
醫學博士 佐藤恒丸
醫學博士 佐々木隆興
醫學博士 佐藤達次郎
醫學博士 男爵 木下正中
醫學博士 木村德衛
醫學博士 菊地循一
醫學博士 北里柴三郎
醫學博士 三田定則
醫學博士 三輪善兵衛
醫學博士 宮川米次
醫學博士 南大曹
醫學博士 島薗順次郎
醫學博士 島村淺澤敬三
醫學博士 篠澁敬次郎
醫學博士 鹽田廣重
醫學博士 鹽原又策
醫學博士 鹽谷不二雄
醫學博士 平井金次郎
醫學博士 平山政藏
醫學博士 日比谷繁次郎
醫學博士 樋口持
醫學博士 男爵 森村市左衛門
醫學博士 安田連吉
醫學博士 杉森彥造
醫學博士 木嶋東吉
醫學博士 鈴木藏之助

實驗ニ據レバ、家鴨移植ノ世代ガ累進シタ後デモ、亦全ク變ハラナイ。卽、家鷄、家鴨共通ノ腫瘍ガ出來タト謂ハレ得ル。此際、兩種動物體ニ於ケル移植腫瘍組織ノ形態及性狀ニ關スル比較研究ハ亦、頗ル興趣ヲ惹クニ足ルモノガアルケレドモ、今玆デハ、之ニ立チ入ラナイ。

家鴨腫瘍ノ增殖ハ寧ロ家鷄ニ於ケルヨリモ旺盛迅速デアル。發育ノ良イモノデハ、移植後十日デ、既ニ鷄卵大或ハ鵞卵大トナリ、若イ家鴨ガ腫瘍增殖ノ爲メ斃死スル頃ニハ、胸筋內移植(初メ米粒大乃至小豆大ノ腫瘍細碎片ヲ移植)ニヨッテ發育シタ腫瘍ハ、多クハ鵞卵大、時トシテハ、手拳大以上ニモ達ス。而カモ其時ノ腫瘍組織中ニハ壞死竈ガ未ダ餘リ廣ク現ハレテ居ラヌ。然シ此組織性格ガ、果シテ今後ノ移植世代ニ於テモ、永ク維持セラレルカ、或ハ若干ノ變化ヲ見ルヤウニナルデアラウカ。之レモ亦此家鴨肉腫ノ生活史ニ就イテノ一問題デアラウ。

移植肉腫ヲ有スル家鴨ノ生命ハ短イ。若イ家鴨デ體ノ兩側ニ移植腫瘍ガ作ラレタ場合ニハ十日乃至十四、五日位デ衰弱シテ死ヌノガ多イ。成熟家鴨デ唯一側ダケノ時ニハ、凡ソ二十餘日デ瀕死狀態トナル。殊ニ家鴨デハ、移植腫瘍增殖ノ爲ニ身體物質代謝ノ上ニ惡影響ガ及ボサレルノガワカル。家鴨デ、特ニ注意サレタノハ、家鷄ト異リ、脾臟ガ殆ド常ニ(例外ハ無イデハナイガ)著明ナ腫大ヲ示スコトデアル。(此脾臟腫大ニ就イテハ、牧宝ノ西條氏ノ研究ガアル。又同氏ガ別ニ述ベルデアラウガ、脾臟以外ノ臟器——肝臟ノ如キ——ニ於テモ、此物質代謝ノ異常ヲ示スニ足ル退行性變化ガ認メラレル。)

家鴨腫瘍ハ、其增殖ガ甚旺盛、且、迅速デアルニ拘ハラズ、自然ニ發現シタ轉移ヲ未ダ目擊シナイ。動物ノ生存期間ノ短イト云フコトモ、其ノ理由ノ一ツデアラウ。

斯ク、家鷄腫瘍ガ移植ニ由ッテ完全ニ家鴨腫瘍トナリ、而カモ之ハ此兩種動物ニ共通ノ腫瘍タトモ謂ハレル。玆ニ於テ、此腫瘍組織ト一方、本來ノ家鷄體、他方、家鴨體トノ生物學的關係如何ハ、甚、興味ノ多イ問題トナッテ來タ。カクテ、

移植マデデアツタ。異種移植ガ一時陽性ニ見エテモ、少數世代ノ後ニ其發育ガ阻止スルコトガアルカラ、果シテ私共ノ異種移植ガ十分確實デアツテ永續スルヤ否ヤハ當時尚、聊、疑問デアツタカラ、私共ハ『今後如何ナル運命ヲ辿ルヤ、我々ノ興味ヲ以テ觀察シヨウトシテヰルトコロ』デアルト曰ヒ、又『果シテ何時マデモ之レガ（移植ガ）續イテ行ハレルナラバ、私共ハ家鴨體ニ適應スルニ至ツタ家鷄肉腫ノ存在ヲ確カメ得ルデアラウ』ト言ツテ置イタガ、爾來一ケ年ノ私共ノ實驗ニ據リ、此異種移植ハ全ク確カメ得ラレタノデアル。卽、其後引キ續イテ家鴨ヨリ家鴨ヘノ肉腫移植ハ常ニ陽性成績ヲ示シ、移植率ハ殆ド常ニ一〇〇%、移植腫瘍發育ノ狀態モ依然トシテ旺盛迅速デアリ、其組織的形態及ビ性狀モ、常ニ原腫瘍組織ニ一致シ（時ニ多少ノ差違ノ現ハレルコトハアルモ）、加之、壞死竈ノ發現ナドハ家鷄ノ腫瘍ニ比シテ却テ少イ。而シテ移植肉腫ヲ有スル家鴨ハ、殆ド皆、之レガ爲ニ衰弱シ斃死スルノデアルカラ、惡性腫瘍ノ移植ガ出來タノダト謂フノニ間違ハ無イ。此移植腫瘍ハ家鴨體ニテ特ニ發育ガ早イカラ、移植モ從テ矢ツギ早ヤトナリ、昨年一月以來今日迄ニ、既ニ四十世代ヲ累ネタ。且、今日ノ形勢デハ、毫末モ衰態ガ見エナイカラ、今後モ永ク同ジヤウニ移植ガ續クト信ジテ居ル。

斯樣ニシテ、私共ハ今ヤ完全ニ家鷄肉腫カラ家鴨肉腫トナツタ可移植性腫瘍ヲ有シテ居ルノデアル。

此家鴨肉腫ハ、幼若ナ家鴨ニノミ移植ガ出來ルノデハナク、十分成熟ノ家鴨ニ於テモ、亦同樣ノ成績ガ擧ゲ得ラレタ。其間、多少發育ノ遲速ハアルヤウデアルガ、兩者共ニ旺盛ナ腫瘍增殖ガ認メ得ラレル。

家鴨ヘノ移植率ハ殆ド一〇〇%デアルト述ベタガ、家鷄ニ於ケルヤウニ、稀ニハ自然的ニ『移植免疫』ノ動物ニ遭遇シタ。今日迄、約一百五十頭（種ツギダケニ使ツタ家鴨ノ數）ノ中、之レガ唯、二隻ダケ見附ケラレタ。此動物體ニハ反覆移植ヲ試ミタガ、常ニ陰性ニ終ツタ。

此家鴨腫瘍ハ、之ヲ家鷄ニ復歸移植スルコトガ亦容易ニ出來ル。之ハ昨年ノ報告ニモ述ベタトコロデアルガ、其後ノ

モ壞死ニ陷リ若クハ陷リツヽアルヤウデアッタ。此復歸移植試驗ハ、豫期ノ如ク、大部分、陰性ニ終ルダケデアッタガ、唯十一日ノもるもっ ミノ例ニ於テ、陽性成績ヲ示スモノ二頭二ケ處ダケアッタ。」○白鼠ニ於ケル同樣ノ試驗（六日・九日・十二日・十五日）ハ割合ニ多ク陽性成績ヲ示シタ。卽、六日ノ例ニテ、家鷄二頭二ケ處（卽、移植筒處ノ全者）ニ、九日ノ例ニテ、一頭二ケ處（同ジク全者）ニ、十五日ノ例ニテ、一頭一ケ處（二頭三ケ處ノ中）ニ、分明ナ粘液肉腫ノ發育ガ認メラレタ。

（乙）冷血動物ニ就テ、私（藤浪）ハ小木氏ト共ニ、蠑ヲ使用ニ供シタ。而シテ色々ノ時季ニ於テ此試驗ヲ行ッタ。之ハ蠑ノ身體ノ物質代謝ガ季節ノ寒暑ニヨッテ差異ヲ生ズルカラデアル。試驗ノ方法ハ前ト同樣デアッテ、先ヅ蠑ノ皮下ニ家鷄肉腫（時トシテハ、家鴨肉腫）ノ細碎片ヲ多量ニ插入シ、種々ノ時日ノ後ニ是等ノ蠑ヲ撲殺シ、之カラ腫瘍片ヲ取リ出シ、之ヲ健康家鷄（若クハ家鴨）ノ皮下ニ復歸移植ヲ行ッタ。此蠑ニ插入シタ腫瘍片ハ、概シテ、比較的長時日ノ間、形態外觀ヲ保存シテ居リ、殊ニ寒冷時ノ試驗デハ、三十餘日ノモノデモ、殆ド新シイ材料ノヤウニ見エタ。私共ハ六日・十日・十一日・十五日・二十五日・三十三日・三十五日後ノ復歸移植ヲ行ッタノデアルガ、意外ニモ多クノ例ニ於テ、陽性成績ガ擧ゲラレタ。例之、五月及ビ七月ニ行ッタ六日ノ例ハ、兩回共ニ陽性（家鷄三頭ノ中、二頭陽性）、十日・十一日ノ例ニモ陽性ノ筒處（家鷄三頭ノ中、二頭陽性）ガ三分ノ二ヲ占メテキタ。然シ十五日・二十五日ノ例（六月及ビ七月ノ試驗）ハ——其試驗例ハ唯、僅少デアッタガ——陰性、又寒イ季節ノ二月カラ三月ニカケテ行ッタ三十三日及ビ三十五日ノ例デハ、其復歸移植ヲ受ケタ家鷄五頭八ケ處ノ中、七ケ處迄、分明ニ陽性成績ヲ示シ、其腫瘍ノ發育ハ皆良好デアッタ。

以上ノ所見ニ據ッテ觀ルニ、家鷄ト全ク緣ノ無イトコロノ冷血動物（蠑）ニ移植サレタ家鷄肉腫組織ハ、固ヨリ其動物體內デ發育ヲ遂グルコトハ無イケレドモ、決シテ直ニ全然死滅スルモノニ非ズ、割合ニ長イ日數、其移植性能ヲ保存シ

體外組織培養竝ニ他ノ種々ノ生物學的研究ニヨッテ、闇明セラル可キ幾多ノ興味アルテーまガ提出セラレルノデアル。（教室ノ隅越氏・日下氏等ノ研究參照。）

私共ノ家鷄ヨリ家鴨ヘノ異種移植ハ、普通ハ、移植セラレタ腫瘍細胞ソレ自身ノ增殖ニ由ルノデアッテ、少クモ、此場合ニ於テハ、細胞以外ノ特異原因體ノ輸入ニ因ル家鴨體内ノ腫瘍新生デハ無イト思ハレル。

中

異種移植ニ關シ、特ニ注意ヲ要スルコトガアル。

異種移植デ、其成績ガ陰性ニ終ル場合ニ於テモ、移植セラレタ腫瘍細胞ハ、異種動物體内デ直ニ死滅スルト限ギラナイ。加之、一定期間、一定程度ノ增殖ヲサヘナシ得ラレルノデアル。故ニ移植陽性ト云フ斷定ヲ下スニハ、大ニ注意ヲ要スル。卽、腫瘍、殊ニ惡性腫瘍ノ異種移植ガ直ニ陽性ダト謂ヘルノハ、移植サレタ腫瘍組織中ノ細胞ノ增殖ガ純エズ進行シ、腫瘍ハ益、發育スルノミデアッテ、動物ハ爲ニ著シク健康ヲ脅カサレルモノデナクテハナラナイ。此意味ニ於テ、我ガ家鷄肉腫ノ家鴨移植ハ、立派ニ惡性腫瘍ノ移植ニ成功シタモノダト謂ハレヨウ。

陰性ニ終ル可キ異種移植デアッテ、移植片ノ腫瘍組織ガ、其異種動物體内デ、一定時ノ間、尙能ク移植性能ヲ保存スルト云フコトニ關シテ、私共ハ同ジク家鷄肉腫ヲ材料トシ、哺乳動物ト冷血動物トニ就キ、特ニ實驗ヲ試ミタコトガアル。鳥類トハ全然類ヲ別ニスル是等動物體内ニ插入セラレタ家鷄ノ組織（腫瘍）デアルカラ、直ニ其生活ガ斷タレテ然ル可キノヤウデアルガ、實際ハ必シモサウデハ無イ。

（甲）哺乳動物デハもるもっと及ビ白鼠ヲ用ヰタ。此試驗ハ若干數ノ動物ニ就キ數回ニ亙リ行ハレタノデアル。卽、此動物ノ皮下ニ家鷄肉腫ノ細碎片ヲ多量ニ插入シ、後、種々ノ日數ヲ經タモノ（もるもっとニテハ八日・十一日・十八日）カラ其插入移植片ヲ取リ出シ、之ヲ更ニ健康家鷄ノ皮下及筋肉内ニ移植シタ。是時ノ移植片ノ組織ハ外觀上ニ

鷄體内ニテ、腫瘍竈以外ニ分布サレテアル（恐ラク血行ニヨリ）『腫瘍起源』ヲ保藏セル臟器（毫モ外觀ニ異ルトコロ無イ）組織ヲ他ノ健康家鷄ニ移植スレバ、其處ニ同一ノ腫瘍ノ出來ルコト、又肉腫ヲ有スル家鷄ノ身體隨處ニ單純ナ炎性肉芽組織竈ヲ作ツテ置ケバ、玆處ニ『腫瘍起源』ガ作用（恐ラク血行ニヨツテ）シテ屢〻同一肉腫ノ形成ヲ見ルニ至ルコトハ、共ニ嘗テ（大正十四年）報告シタトコロデアル、今ヤ、此私共ノ實驗ニヨリ、此『腫瘍起源』ガ體内臟器——全ク健態ニ見エル臟器——ニ分布シ、且、保留セラルルコトハ、嘗ニ本來ノ家鷄若クハ家鴨體若クハ同シ『綱』ニ屬スル鳥類ニ於テノミナラズ、移植ノ全ク陰性ナ異種動物、卽、哺乳動物（白鼠）ヤ冷血動物（蠑）ニ於テモ、亦實現サレ得ルト云フ事實ガ明ニナツタ。

此『腫瘍起源』ガ腫瘍細胞ソレ自身ナルカ、將タ特殊ナ微體ナルカ、或ハ腫瘍細胞ニ由來スル物質ナルヤ等ニ就テハ、私共ノ實驗ニ於テ、考慮ニ上ツタモノガ若干アツタケレドモ、確定ト云フニハ足ラナイカラ、之ニ關スル研究ノ方面ニハ、今言及ヲ敢テセヌ。

癌腫ト血液型トノ關係竝ニ血液型上ヨリ觀タル癌腫發生素因ニ就テ

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寺田秀男

第一章　緒論

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第一節　余ノ調査成績

得ルノデアル。もるもっさヤ白鼠ノ如キ哺乳動物ニテモ、亦似同ノコトガアル。

下

此蟇ノ實驗ニ於テ、更ニ私共ノ興趣ヲ一層深クサセタ所見ハ、先年ニ報告シタ所謂「腫瘍起源」ノ體内分布及ビ保有ニ關スルコトデアル（大正十四年ノ報告參照）。之モ亦小木氏下一所ニ行ツタ試驗ノ一部分ダ。又蟇ノ試驗ト前後シテ鳥（鳩）及ビ哺乳動物（もるもっさ及ビ白鼠）ニモ同樣ノ實驗ヲ行ツタコトガアル。鳩ニ就イテハ、昨年ノ報告ニモ一言解イテ置イタヤウニ、家鷄肉腫ヲ移植シテ置イタ此動物カラ肺臟ヲ剔出シ、其細碎片ヲ健康家鷄體ニ接種シタ結果、唯、僅少例ニ僅少ノ粘液肉腫組織ノ發生ガ認メラレタ。其後、同樣ノ試驗ヲもるもっさ及白鼠ニモ行ツテ見タガ、もるもっさ肺ノ方デハ陽性例無ク、白鼠ノ方デハ、其肺臟（脾モ用キタ）組織片ヲ移植シタ家鷄十一頭、移植筒處十八ノ中、唯、一ケ處（肺臟組織移植）ニノミ、緩慢乍ラ粘液肉腫ノ發生ガ認メラレタ。此例ハ肉腫家鷄カラ其肉腫片ヲ白鼠ノ皮下ニ移植シテ十五日ノ後ニ、同動物ノ肺臟ヲ剔出シ其組織片ヲ以テ健康家鷄皮下ニ復歸移植ヲ行ツタモノデアル。

蟇デハ、此種ノ實驗ノ成績ガ寧ロ良好デアツタ。家鷄肉腫組織ヲ多量ニ皮下ニ植エタ蟇ヲ種々ノ時日ノ後ニ殺シ、移植部トハ全然無關係ナ肺・肝及ビ脾ヲ十分ニ注意シテ剔出シ、此臟器ノ細碎片ヲ、健鷄ノ皮下若クハ胸筋内ニ插入シタ。此際、蟇ノ皮下ニ插入サレテアル家鷄肉腫片ヤ並ニ其部位ニ接觸スルヤウナコトハ絶對ニ無カツタト明言出來ル。此試驗ニ於テ、家鷄腫瘍片接種後五日及六日ノ蟇ノ肺臟片ヲ移植シタ健康家鷄ハ六頭、移植筒處ハ十四デアツタガ、其中ノ四頭九ケ處ニテ分明ニ粘液肉腫ノ發育ガアリ、此肉腫ハ亦他ノ家鷄ニ對シテ明ニ可移植性ヲ示シタ。其他、九日・十一日・十五日・二十一日ノ諸例中、確實ニ十分陽性ダト謂ハレルモノハ、是レマデノトコロ見出サレ得無カツタケレドモ、十五日例ニテ、唯一回、稍陽性ト思ハレル所見ガアツタ。

以上ノ成績ハ、一見奇異ノヤウデアルガ、又少數デハアツタガ、其確實ヲ疑フ餘地ハ更ニ無イ。家鷄肉腫ヲ有スル家

Eden 氏(1922) ハ同種血球凝集反應ニ據ル血液型ハ同一人ニ於テ一定不變ノモノニ非ラズシテ諸種ノ藥劑或ハれんとげん線等ニヨリ一時的ナルモ其特異性ニ變化ヲ來スト報告セリ。然ルニ其後 Meyer u. Ziskoven 兩氏ハ Eden 氏ノ實驗ヲ追試シテ同說ノ謬見タルヲ指摘シ、中島(忠)、Barsky、八木及大道氏等モ亦血液型ノ不變ナル事ヲ認メタリ。

更ニ血液型ノ遺傳ニ關シテハ今日 Ottenberg, 桐原, Bernstein, 及古畑氏等ノ諸說アリテ詳細ニ亙リテハソレゾレ差異アルモ、血液型ガ Mendel 氏ノ法則ニ從ヒテ遺傳スル事ニ關シテハ相一致ス。

卽チ、同種血球凝集反應ハ一定ノ比率ヲ以テ人類間ニ分布セラレ、且ツ此ノ特異性ハ一度完成スルヤ一生涯ヲ通ジ一定不變ナル生理的現象ニシテめんでりすむすニ從ヒテ遺傳スルモノナリ。

然ラバ此ノ血液各型ノ一定ノ比率ハ各種疾病ニ對シテモ亦一定ナルカ或ハ其ノ比率ニ相違ヲ來スモノナリヤ。

文獻ヲ繙クニ、Strasżynski 氏(1925) ハ黴毒ト血液型トノ關係ニ就キテ檢シ、A型及O型ナル者ハB型及AB型ナル者ニ比シテ驅黴療法ニヨリ早クワル氏反應ノ陰性トナル事ヲ唱ヘ、Gundel 氏(1926) ハ變性黴毒ニ於テハB型及AB型ナル者比較的多クシテ、A型及O型ナル者ノ比較的ニ少キ事ヲ認メ、又 Amsel u. Halban 兩氏(1925) ハ多數ノ黴毒患者ヲ檢査シO型ナル者ニワル氏反應ノ陰性者多シト言ヘリ。

大道氏(1926) ハ癩ノ同種血球凝集反應ヲ檢シ、癩患者ニ於テハ其血液型中一般ニB型多ク、A型ハ比較的ニ少シト言ヒ、又同氏ハ皮膚科泌尿器科領域ニ於ケル血液型ニ就キテ調査シ、皮膚結核、皮膚癌及結石等ノ疾患ニ於テハO型ナル者少ク比較的ニA型ナル者ノ多キ事、又尋常性疣贅及變性黴毒ニハB型ナル者ノ多キ事ヲ示セリ。

精神病者ノ血液型ニ關シテ Wilczykowski 氏(1927) ハ早發性癡呆及癲癇性癡呆ノ血液型ヲ研索シ、癲癇性癡呆及癲癇性脊髓痨疾ニ其發病後三ケ年以上ヲ經過セザルモノニAB型ノ著明ナル事卽チAB型ナル者ハ同ジク黴毒ニ罹患セル際、癲癇性癡呆卽チ黴毒性精神病ヲ惹起シ易キ素質ヲ有スト論逃セリ。又滝野氏(1926) ハ神經疾患ト血液型トノ關係ニ就キ調査シ、一般ニ神經疾患ハA型ナル者ニ最モ多ク、B型ナル者之レニ次ギ、O型及AB型ナル者ニハ少ナシト報告セリ。王丸氏(1926) モ亦各種精神疾患ト血液型トノ關係ニ就キテ研索シ、西部日本人ニ於テハ器質的精神疾患ハA型及B型ナル者ニ多ク、變質性精神病ニ於ケル血液型分布率ハ概シテ健康者ノ其

第二節　癌腫患者ニ於ケル血液型分布率ト健康人血液型分布率トノ比較
第三節　總括
第四章　癌腫ト血液型トノ關係ニ關スル余ノ調査成績ト諸家ノ調査成績トノ比較、竝ニ本邦ノ癌腫患者ニ於ケル血液型分布率及人種係數
第一節　余ノ調査成績ト諸家ノ調査成績トノ比較
第二節　本邦ノ癌腫患者ニ於ケル血液型分布率及人種係數
第五章　本邦各地方及諸外國ニ於ケル癌肺死亡率ト其血液型分布率トノ關係
第一節　本邦各地方ニ於ケル癌肺死亡率ト該地方人ノ血液型分布率トノ關係
第二節　諸外國ニ於ケル癌腫死亡率ト其血液型分布率トノ關係
第六章　總括及癌腫ト素因
第七章　結論
主要文獻

第一章　緒論

血液型ニ關スル業績ガ法醫學上、人類學上ニ貢獻セシ事ノ多大ナルハ一般ニ認メラルヽ所ナリ。而シテ更ニ此レヲ臨牀學上ニ應用シテ血液型ト諸種疾患トノ間ニ一定ノ關係有リヤ無シヤ或ハ少クトモ疾患ニ對スル素質トノ間ニ一脈ノ關聯ノ存スルモノナリヤ否ヤハ既ニ先人ノ著目檢索セシ所ニシテ發表セラレタル業績モ亦尠ナカラズ。

顧ルニ、S. Shattock 氏ガ始メテ肺炎其他一定ノ疾患ニ際シ、人血清ノ同種血球ニ對シ凝集反應ヲ呈スル事ヲ認メシハ一八九九年ナリ。次デ Landsteiner 氏(1900)モ亦或ル種類ノ疾病ニ對シ同種血球凝集反應ノ發現スル事ヲ發表シ、當時ニ於テハ該反應ヲ以テ病的現象トセリ。然ルニ其後 Landsteiner 氏ハ健康人ニ於テモ亦此ノ同種血球凝集反應ノ存在スル事ヲ認メ、此ノ反應ニヨリ人血液ヲ三種ニ分類シ、茲ニ人血液分類ノ基礎ヲ作レリ。

次テ Descastello und Sturli(1902), Jansky(1907), Moss(1910), v. Dungern und Hirschfeld(1910)氏等ノ研究ニヨリ、Landsteiner 氏ノ分類ニ更ニ一種ヲ加ヘ、始メテ人類血液ハ四型ニ分類セラルヽニ到レリ。

Halban u. Landsteiner 及 Happ 氏等ハ血液型ガ生後一度定マルヤ一生涯ヲ通ジ如何ナル影響ニヨリテモ變化ヲ來サヾル事ヲ發表セリ。

シ、次デ患者ノ耳朶ヲ尖刀ニテ輕ク切リ、出ル血液ヲ尖刀端ニ少量附著セシメ之レヲ載物硝子上ニ移シ、前記標準血清ト混セシメ、載物硝子ヲ振盪シテ充分ニ混和セシメタリ。

或ハ血液ヲ一・五%ノ枸櫞酸曹達加生理的食鹽水溶液ヲ容ル、小試驗管内ニトリ、遠心器ニカケ生理的食鹽水ニテ二乃至三回洗滌シ、約五%ノ赤血球浮游液ヲ作リ、其少量ヲ前記標準血清ト混和セシメタリ。

斯クテ五分乃至十分ノ後ニ主トシテ肉眼的ニ檢シ、更ニ完全ヲ期スルガ爲ニ時ニ顯微鏡下ニテ之レヲ檢シ或ハ反覆檢査セリ。

自家血球凝集反應ヲ防ガガ爲ニ常ニ室温十八度乃至二十二度ノ時ニ檢査ヲ行ヘリ。

第三章　實驗成績

癌腫ト血液型トノ關係

第一節　余ノ調査成績

余ノ調査セル癌腫總數一〇九例ニ於ケル成績ハ次ノ如シ。（第一表）、卽チ、癌腫總數一〇九例中O型ナルモノ二三例、A型ナルモノ四七例、B型ナルモノ二五例、及AB型ナルモノ一四例ナリ。更ニ癌腫ノ發生部位ニヨリテ分類スレバ、胃癌ハ二四例ニシテ内O型四例、A型十例、B型六例、AB型ナルモノ四例ナリ。直腸癌ハ七例ニシテ内O型二例、A型四例、B型一例ニシテ、AB型ナルモノナシ。舌癌ハ三例ニシテ内O型一例、A型二例、B型及AB型ナルモノナシ。口脣癌ハ二例ニシテ内A型一例、AB型一例、O型及B型ナルモノナシ。膝部瘢痕癌ノ一例及腕關節部表皮癌ノ一例ハ共ニAB型ナリ。腸癌ハ三例ニシテ内A型二例、B型一例、O型及AB型ナルモノナシ。肛門癌ハB型ナルモノ一例ノミ。肝臟癌ハ二例ニシテ内O型一例、A型一例ニシテB型及AB型ナルモノナシ。肺臟癌ハA型ナルモノ一例ノミナリ。乳癌ハ一二例ニシテ、内O型五例、A型二例、B型四例、AB型ナルモノ一例ナリ。子宮癌ハ五二例ニシテ内O型二〇例、A型二四例、B型一二例、AB型六例ナリ。

レニ近似シ、早發性癡呆ニ於テハO型著シク增加シ、A型ノ減少ヲ認ムト發表セリ。

惡性腫瘍ト人類ノ血液型トノ間ニ一定ノ關係アル事ヲ初メテ唱道シ世人ノ注意ヲ喚起セル學者ハ英國ノ W. Alexander 氏(1921)ナリ。卽チ、同氏ハ血液型ト遺傳トノ間ニ一定ノ關係存ストセバ從來遺傳性ナリト思惟セラレタル惡性腫瘍ト血液型トノ間ニモ亦何等カノ關係アラムトノ想像ノ下ニ之レガ研究ヲ試ミ、AB型及B型ナル者ノ多數ナルヲ認メ而カモ其臨牀的所見ハ一般ニ甚ダ惡性ナリトセリ。然ルニ同年 Buchman, J. Arthur, Higley, T. Edith 氏等ハ此レニ反對シ、此レヲ以テ民族性ヲ閑却セルタメナリトセリ。又 Elnandi 氏(1927)モ惡性腫瘍患者一五〇名ノ血液型ヲ調査シテ報告セリ。

本邦ニ於テハ權藤氏(1925)之レガ檢索ニ從事シ、本邦人惡性腫瘍ニ於テハA型及B型トノ間ニ相對的關係アリトセリ。次デ小原氏(1926)モ亦癌腫患者ノ血液型ヲ檢シ、癌腫ガAB型及B型ナル者ニ比較的多數ナル事ヲ認メタリ。最近中島(精)氏(1928)ハ子宮癌患者ノ血液型ヲ檢査シテ第二十六回婦人科學會ニ報告シ、又新谷氏モ癌腫患者ノ血液型ニ就テ其成績ヲ發表セリ。

以上諸氏ノ報告ヲ通覽スルニ、諸種ノ疾患ト血液型トノ關係ニ就テハ未ダ確然タル斷定ヲ下シ得ザルガ如ク又癌腫ト血液型トノ關係ニ關スル諸氏ノ報告ニ於テモ唯漠然ト兩者間ノ關係ヲ想定シタルニ過ギザルガ如シ。

余モ亦昨年來川上敎授指導ノ下ニ癌腫ト血液型トノ關係ニ就キテ檢査シ、是等兩者間ニ或ル關係ノ存スル事ヲ認メ得タリ。而シテ余ハ此ノ事實ヲ基礎トシテ建テタル余ノ考案ニ依レバ或ル程度マデ本邦各地方竝ニ諸外國ノ癌腫發生頻度ニ對シ別種ノ新ラシキ說明ヲ與ヘ得ベキヲ惟フ。

第二章　研究材料及實驗方法

血液材料ハ主トシテ本院外來及入院患者ヨリ採レリ。其他濟生會病院入院患者及剖檢時屍體ヨリ取レルモノモ亦尠ナカラズ。

標準血清ハ中島精氏ノ好意ニヨリ分讓セラレタルモノヲ基礎トシテ作リシモノニシテ、血清ハ法ノ如ク分離シ之レニ〇・五%ノ割ニ石炭酸ヲ加ヘテ氷室內ニ貯藏セリ。

實驗方法トシテハ、栽物硝子ノ水洗後、あるこーる、えーてる等分液ニ浸シ置キタルヲ清ク拭ヒタルモノ、上ニ標準血清一滴ヲ落

之レニ對シ健常人ニアリハ血液ノA型ナル者最モ多數ニシテ、其ノO型ナル者之レニ次ギ、其ノB型ナル者更ニ之レニ次ギ、其ノAB型ナル者最モ少ク、其ノ順位ハA＞O＞B＞AB ナリ。

而シテ此ノ前者ノ場合ニ於ケル順位ノ相異ハ癌腫患者ニシテ其ノ血液型ノO型ナル者ノ著シク少キニ基ヅク。

之レ癌腫ガ血液型中各型ニ平等ニ發生セザル事ヲ示スモノナリ。

換言スレバ癌腫ハ何レノ血液型ノ者ニ於テモ發生スルモノナリト雖モ、A型ナル者ニ於テモ最モ發生シ易ク、B型ナル者ニ於テ之レニ次ギO型ナル者ニ於テ更ニ之レニ次ギ、血液ノAB型ナル者ニ於テ癌腫發生ハ困難ナルモノニ似タリ。現今癌腫ノ發生ニ關スル諸種ノ學說アレドモ、其ノ何レニ就キテ之レヲ觀ルモ尙遺憾ノ點ナキニ非ラズ。今余ノ成績ニ由リテ之レヲ觀ルニ、癌腫ノ發生ニハ自ラ素因アリテ、其ノ强弱或ハ濃淡ハ血液型ト深キ關係ノアルベキヲ想定シ得ベク、此ノ想定ハ癌腫ノ發生ニ就キ別途ノ說明ヲ與フルモノト思惟ス。

更ニ癌腫患者ニ於ケル生物化學的人種係數ト東京地方健常人及日本人平均（古畑氏）ノ人種係數トヲ比較スルニ次ノ

第　二　表

著者	血液型／例數	O	A	B	AB
寺田（癌腫）	109	21.1	43.1	22.9	12.8
白井、中島（忠） 石川、平野 矢島、中島（精）	3097	31.29	38.42	21.02	9.27
東京地方人血液型百分比トノ差違ノ夫レ		−10.19	+4.68	+1.88	+3.53

第　三　表

血液型分布率ノ順位	
健常人（東京地方）	A＞O＞B＞AB
癌腫（寺田）	A＞B＞O＞AB

第　四　表

著者	人種係數
白井、中島（忠） 平野、矢島 石川、中島（精）	1.574
日本人平均（古畑）	1.50
寺田（癌腫）	1.566

以上癌腫總數一〇九例ノ血液型ヲ通覽スルニ、A型ナルモノ最大多數ニシテB型ナルモノ之レニ次ギ、O型ナルモノ更ニ之レニ次ギ、AB型ナルモノハ最モ少ク、其順位ハA＞B＞O＞ABナリ。卽チ癌腫ハ何レノ血液型ノ人ニモ發生スレドモA型ナル人ニ最モ多數ニ發生スルモノト謂ヒツベシ。

次ニ其ノ百分率ヲ觀ルニ、O型二一・一%、A型四三・一%、B型二二・九%、及AB型一二・八%ニシテ、東京地方健常人ノ血液型分布率ニ比シ著明ナル差異ヲ認ム。

又其ノ生物化學的人種係數ハ一・五六六ニシテ健常人ノ其レニ比シ大差ナシ。

第一表

病名	例數	血液型	O (I)	A (II)	B (III)	AB (IV)
胃癌	24	男	3	8	5	4
		女	1	2	1	0
		計	4	10	6	4
直腸癌	7	男	1	2	1	0
		女	1	2	0	0
		計	2	4	1	0
舌癌	3	男	1	2	0	0
		女	0	0	0	0
		計	1	2	0	0
口脣癌	2	男	0	1	0	1
		女	0	0	0	0
		計	0	1	0	1
膝腕皮癌	2	男	0	0	0	2
		女	0	0	0	0
		計	0	0	0	2
腸癌	3	男	0	2	1	0
		女	0	0	0	0
		計	0	2	1	0
肛門癌	1	男	0	0	1	0
		女	0	0	0	0
		計	0	0	1	0
肝臟癌	2	男	1	1	0	0
		女	0	0	0	0
		計	1	1	0	0
肺臟癌	1	男	0	1	0	0
		女	0	0	0	0
		計	0	1	0	0
乳癌	12	男	1	1	0	1
		女	4	1	4	0
		計	5	2	4	1
子宮癌	52	女	10	24	12	6
合計	109	男	6	14	7	7
		女	17	33	18	7
		計	23	47	25	14
百分比			21.1	43.1	22.9	12.8

第二節　癌腫患者ニ於ケル血液型分布率ト健常人血液型分布率トノ比較

癌腫ハ血液四型中各型ニ略平等ニ發生スルモノナリヤ否ヤヲ觀ルニ、余ノ調査セル癌腫患者ニ於ケル血液型分布率ト東京地方健常人ニ於ケル血液型分布率トヲ相對比スルニ其間顯著ナル差異アルヲ認ム。（第二表）

卽チ癌腫患者中血液ノA型ナルモノ最モ多數ニシテ、其ノB型ナル者之レニ次ギ、其ノO型ナル者更ニ之レニ次ギ、其ノAB型ナル者最モ少ク、其ノ順位ハA＞B＞O＞ABナリ。（第三表）

成績ニ現ハレタル此ノ事實ガ諸家ノ業績ニ於ヲモ認メラル、モノナリヤ。又前章ニ於テ余ハ血液型ノ相違ニ由ル癌腫發生ノ難易ニ就キテ論述セルモ、此ノ考案ガ果シテ諸家ノ業績ニ於テモ亦該當スルモノナリヤ否ヤ。

抑本邦ニ於テ癌腫ト血液型トノ關係ニ就キ其研究ヲ發表セシモノハ極メテ少ク、權藤、小原、中島(精)、及新谷氏等ノ外余ハ未ダ之レヲ聞カズ。サレド小原及新谷兩氏ノ調査成績ハ其ノ檢索例數ノ少キヲ遺憾トセザルヲ得ズ。又中島(精)氏ノ成績ハ子宮癌ノミニ限ラレタルモノナリ。權藤氏ノ成績ニ關シテハ同氏ノ論文中ヨリ癌腫ニ關スルモノノミヲ摘錄セリ。

而シテ今權藤氏及中島(精)氏ノ調査成績ト余ノ成績トヲ比較スレバ次ノ如シ。

(第五表)

即チ、先ヅ癌腫患者ニ於ケル血液分布率中各型ノ比率ノ順位ヲ觀ルニ健常人ノ場合ト異ナリ、其ノ血液型中A型最モ高ク、B型之レニ次ギ、

第五表

著者		血液型 / 例數	O	A	B	AB	人種係數	百分率ノ順位
權藤	癌腫	96	19.8	53.1	22.9	5.2	2.07	A>B>O>AB
	健康人	333	28.9	40.8	19.8	10.5	1.7	A>O>B>AB
	兩者ノ差		−9.1	+12.3	+3.1	−5.3		
中島(精)	子宮癌腫	115	23.5	38.3	20.3	7.8	1.21	A>B>O>AB
	健常人(女)	1000	29.8	40.3	20.3	9.6	1.069	A>O>B>AB
	兩者ノ差		−6.3	−2.0	+10.0	−1.8		
寺田	癌腫	109	21.1	43.1	22.9	12.8	1.566	A>B>O>AB
白井、中島(恭)、石川、矢島、平塚、中島	健常人	2097	31.29	38.42	21.02	9.27	1.574	A>O>B>AB
	兩者ノ差		−10.19	+4.68	+1.88	+3.53		

如シ。（第四表）、卽チ癌腫患者ニ於テハ人種系數ハ一、五六六ニシテ東京地方健常人ノ一、五七四ト略ゝ等シク、日本人平均（古畑氏）ノ一、五〇ニ比シ幾分高キニ過ギズ。

卽チ癌腫ハ日本人中ノ特殊ノ者ニ發生スルニハアラズ。

第三節　總　括

以上二節ニ亙リテ記載セル所ヲ總括スレバ次ノ如シ。

（一）余ノ調査セル癌腫中、胃癌二四例、直腸癌七例、舌癌三例、口脣癌二例、膝部瘢痕癌一例、腕關節部表皮癌一例、腸癌三例、肛門癌一例、肝臟癌二例、肺臟癌一例、乳癌十二例及子宮癌五二例ニシテ其總數一〇九例ナリ。

（二）癌腫患者ニ於ケル血液型ノ分布ハ次ノ如シ。卽チ總數一〇九例中血液ノO型ナリシモノ二三例、（二一・一％）、其ノA型ナリシモノ四七例（四三・一％）、其ノB型ナリシモノ二五例（二二・九％）、其ノAB型ナリシモノ一四例（一二・八％）ナリ。

（三）健常人ニ於ケル各血液型ノ比率ノ順位ハA型、O型、B型及AB型ノ順ナルニ反シ、癌腫患者ニ於ケル其ノ血液各型ノ比率ハA型最モ高ク、B型之レニ次ギ、O型更ニ之レニ次ギ、AB型最モ低シ。

（四）癌腫患者ニ於ケル生物化學的人種係數ハ一、五六六ニシテ東京地方人ノ其レト略ゝ等シク、日本人平均（古畑氏）一、五〇ニ比シテモ亦略ゝ相等シ。

第四章　癌腫ト血液型トノ關係ニ關スル余ノ調査成績ト諸家ノ調査成績トノ比較竝ニ本邦ノ癌腫患者ニ於ケル血液型分布率及人種係數

第一節　余ノ調査成績ト諸家ノ調査成績トノ比較

余ハ前章ニ於テ癌腫患者ニ於ケル血液各型ノ比率ノ順位ガ健康人ノ其レニ比シテ相異レル事ヲ述ベタリ。而シテ余ノ

テハ其ノ發生ノ比較的容易ナルモノト謂ヒツベシ。

第二節　本邦ノ癌腫患者ニ於ケル血液型分布率及人種係數

余ハ權藤、小原、中島(精)、及新谷氏等ノ成績ト余ノ成績トヲ併合シテ其ノ血液型ノ比率ヲ求メ、之レヲ假リニ本邦ノ癌腫患者ニ於ケル血液型ノ分布率トセリ。次ノ如シ。(第六表)

第　六　表

著者 ＼ 血液型 例數	例數	O	A	B	AB
權藤	96	19.8	53.1	22.9	5.2
小原	34	32.3	26.5	29.4	11.8
中島(精)	115	23.5	38.3	30.3	7.8
新谷	19	15.8	47.4	26.3	10.5
寺田	109	21.1	43.1	22.9	12.8
合計	373	22.0 (82)	43.0 (160)	26.0 (97)	9.1 (34)

(括弧内ノ數字ハ例數ヲ示ス)

第　七　表

著者 ＼ 血液型 例數	例數	O	A	B	AB	種人係數
癌腫(平均)	373	22.0	43.0	26.0	9.1	1.48
日本人平均(古畑)	29480	30.86	37.66	21.79	9.68	1.50
兩者ノ差		−8.86	+5.34	+4.21	−0.58	

卽チ、本邦ノ癌腫患者三七三例中其ノ血液型ノO型ナル者八二例、同A型ナル者一六〇例、同B型ナル者九七例及同AB型ナルモノ三四例ナリ。

而シテ其ノ百分率ハO型二二・〇%、A型四三・〇%、B型二六・〇%及AB型九・一%ニシテ、同比率中A型最モ高ク、B型之レニ次ギ、O型更ニ之レニ次ギ、同AB型最モ低シ。

此ノ成績ト日本人平均ノ血液型百分率トヲ比較スレバ次ノ如シ。(第七表)、卽チ、癌腫患者ニ於テハ健常人ニ於ケルニ比シ、其ノ血液型百分率中A型ノ比率ハ顯著ニ增加シ、同B型ノ比率モ之レニ次デ增加セルニ對シ、同O型ノ比率ハ著明ニ、同AB型ノ比率ハ僅ニ減少セルヲ認ム。

O型更ニ之レニ次ギ、AB型ノ最モ低キ事ハ既ニ余ノ認メタル所ニシテ、此ノ事實ハ等シク權藤氏及中島（精）氏ノ成績ニ於テモ亦認メ得。

次ニ癌腫患者ノ場合ニ於ケル血液各型ノ比率ト健常人ノ同比率トヲ比較シテ其ノ增減ノ程度ヲ檢スルニ、權藤氏ノ成績ニ於テハ癌腫患者ノ場合ニハ健常人ノ場合ニ比シ、血液型分布率中其ノ比率ノ增加ハA型ニ於テ最モ高ク、B型之レニ次ギ、反之O型及AB型ニ於テハ共ニ著シク減少セリ。中島（精）氏ノ成績ニ於テハ癌腫患者ノ場合ニハ健常人ノ場合ニ比シ、其ノ血液型百分率中B型ノ比率ガ顯著ニ增加セルニ對シ、他ノ二型ノ比率ハ減少シ、就中O型ノ場合ニ於モ著明ニシテA型及AB型ノ比率ハ僅ニ減少セリ。

以上兩氏ノ成績ト余ノ成績トヲ對比スルニ、癌腫患者ニ於ケル血液型分布率中O型ノ比率ハ健常人ノ其レニ比シ、常ニ顯著ニ減少スルモノニシテ、此ノ事實ハ權藤、中島（精）氏等ノ成績ニ於テモ亦等シク認メラレ余ノ成績ト一致スル所ナリ。次ニ同A型ノ比率ガ癌腫患者ノ場合ニ於テ健常人ノ場合ニ比シ顯著ニ增加スル事ハ權藤氏ノ成績ニ於テモ亦認メラレ余ノ成績ト一致ス。サレド中島氏ノ成績ニ於テハ之ト反對ニ却テ減少セリ。又癌腫患者ノ場合ニ於ケル同B型ノ比率ハ常ニ健常人ノ其レニ比シ增加ヲ認メ得ルモ、權藤氏及余ノ成績ニ在リテハ其ノ差違僅ニシテ、中島氏ノ成績ニ於テハ其ノ增加ノ度特ニ高シ。更ニ同AB型ノ比率ニ就テ觀ルニ、癌腫患者ノ場合ニ健常人ノ其レニ比シテ增加ヲ認メ得ルハ余ノ成績ニ於テノミニシテ、權藤氏及中島氏ノ成績ニ於テハ共ニ減少セリ。

要之、癌腫患者ニアリテハ其ノ血液型分布率中O型ノ比率ハ健常人ノ場合ニ於ケルモノニ比シ常ニ著シク減少スルモノニシテ、反之同A型ノ比率ハ前者ノ場合ニ顯著ニ增加ヲ來スモノ、如シ。而シテ同B型ノ比率ハ癌腫患者ノ場合ニハ常ニ健常人ノ其レニ比シ增加シ、又同AB型ノ比率ハ其ノ增減不定ナリ。此ノ事實ヨリ推定スルニ、稍ミ早急ニ失スルノ嫌ヒナキニ非ラズト雖モ、癌腫ノ發生ハ血液型中O型ナル者ニ於テハ困難ナルモノニシテ、反之同A型ナル者ニ於

第八表

順位	府縣名	癌腫死亡率
1	奈良	12.1
2	佐賀	9.3
3	和歌山	8.7
4	京都	8.1
5	新潟	8.0
6	千葉	8.0
7	滋賀	8.0
8	大阪	7.9
9	山口	7.7
10	三重	7.6
11	福岡	7.4
12	鳥取	7.3
13	島根	7.3
14	宮城	7.2
15	山形	7.0
16	東京	7.0
17	埼玉	6.9
18	茨城	6.9
19	長野	6.9
20	石川	6.9
21	愛媛	6.8
22	富山	6.7
23	栃木	6.7
24	岡山	6.6
25	熊本	6.6
26	山梨	6.4
27	福島	6.4
28	神奈川	6.2
29	兵庫	6.0
30	福井	6.0
31	群馬	5.9
32	岐阜	5.9
33	廣島	5.9
34	香川	5.9
35	宮崎	5.9
36	長崎	5.7
37	大分	5.7
38	愛知	5.6
39	高知	5.6
40	德島	5.5
41	靜岡	5.0
42	秋田	5.0
43	鹿兒島	4.6
44	北海道	4.5
45	岩手	4.3
46	青森	4.1
47	沖繩	3.6

要スルニ、第八表ニ就キテ觀ルニ、癌腫死亡率ノ高率ヲ示スハ近畿、關東、山陰、本洲北部（新潟、山形、宮城ノ三縣）及九州北部ノ五地方ナリ。之レニ對シ、癌腫死亡率ノ低キ地方ハ北海道、東北、東海道、九州東南部、及四國地方竝ニ沖繩縣等ナリ。

地方ニヨリテ其ノ癌腫死亡率ガ斯クノ如キ差異ヲ示ス所以ヲバ吾人抑如何ニシテ解說スベキヤ。

余ハ本邦各地方人ニ於ケル血液型分布率ノ如何ヲ知ラント欲シ、文獻ヲ涉獵シテ之レヲ蒐集シ、更ニ之レヲ該地方ニ於ケル癌腫死亡率ニ配シテ試ミニ表示セリ。（第九表）

而シテ前章ニ述ベタル余ノ想定ノ下ニ第八表及第九表ヲ比較對照スルニ、本邦各地方ノ癌腫死亡率ノ高低ト該地方人ノ血液型分布率トノ間ニ於テモ亦或ル關係ノ伏在スルヲ窺知シ得タリ。卽チ、癌腫死亡率ノ七・〇以上ヲ示ス地方中東京、大阪、和歌山ニ於テハ該地方人ノ血液型分布率中A型ノ比率ガ三八・〇%以上、仙臺ニ於テハ同A型ノ比率ハ三九・

要スルニ、本邦ノ癌腫患者ト血液型トノ關係ニ於テモ亦明ニ癌腫發生頻度ガ其ノ血液型中A型ナル者ニ於テ比較的ニ最モ高ク、反之O型ナル者ニ於テ最モ低キ事ヲ認メ得。

本邦ノ癌腫患者ニ於ケル生物化學的人種係數ハ一・四八ニシテ L. u. H. Hirschfeld 氏等ノ中間型ニ屬シ、又日本人平均ノ人種係數(古畑氏)一・五〇ニ比シ稍々低シ。

第五章　本邦各地方及諸外國ニ於ケル癌腫死亡率ト其ノ血液型分布率トノ關係

第一節　本邦各地方ニ於ケル癌腫死亡率ト該地方人ノ血液型分布率トノ關係

癌腫ガ其ノ血液型ノA型ナル者ニ好發スルニ反シ、同O型ナル者ニ於テ其ノ發生ノ極メテ困難ナル事ニ關シテハ既ニ前章ニ述ベタリ。余ハ此ノ事實ヲ基礎トシテ更ニ一歩ヲ進メ、本邦各地方ニ於ケル癌腫死亡率ト該地方人ニ於ケル血液型分布率トノ間ニモ亦或ル密接ナル關係ノ存在スルモノナランカト思惟シ、先進諸學者ノ業績ヲ渉獵シ、此等ヲ比較對照シテ其ノ關係ヲ考究セリ。

蓋シ癌腫死亡率ガ本邦各地方ニ於テ一樣ナラズシテ其ノ間ニ多少ノ差違アルト同時ニ、各地方人ノ血液型分布率モ亦此等相互間ニ於テ相違スレバナリ。

今明治四十四年ヨリ大正四年ニ到ル五ケ年間平均ノ本邦各地方ニ於ケル人口一萬ニ對スル癌腫ノ死亡率ヲ表示スレバ次ノ如シ。(第八表、草間弘司氏ニヨル)

卽チ、癌腫死亡率ノ最高ナルハ奈良縣、第二位佐賀縣、第三位和歌山縣ニシテ癌腫死亡率ノ七・〇以上ナル地方ハ上記奈良縣ヨリ第十六位ノ東京府ニ至ル三府十三縣ナリ。反之、癌腫死亡率ノ最低ナルハ沖繩縣ニシテ、之レニ次ギテ低キハ靑森縣及岩手縣ノ順ナリ。又癌腫死亡率ノ六・〇以下ナルハ上記三縣ヲ加ヘ郡馬縣ニ至ル十六縣及北海道ナリ。

○%以上、更ニ佐賀、福岡及京都ニ於テハ同A型ノ比率ハ何レモ四〇・〇%以上ヲ示セリ。但シ、茨城、山形、千葉ニ於テハ同A型ノ比率ハ三六・五%以下ニシテ、新潟ニ於テハ三七・八五%ナリ。

反之、癌腫死亡率ノ五・五以下ナル地方中、鹿兒島ニ於テハ其ノ血液型分布率中A型ノ比率ハ三七・五%以下、岩手(盛岡)ニ於テハ同ジク三七・〇%以下、北海道ニ於テハ同A型ノ比率ハ三六・〇%以下ニシテ、青森、秋田、沖繩等ニ於テハ同A型ノ比率ハ三五・〇%以下ヲ示セリ。

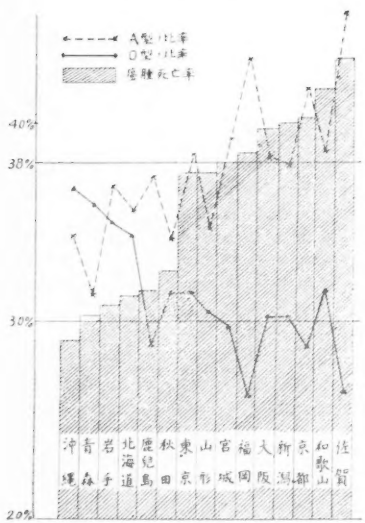
又血液型分布率中O型ノ比率ニ就テ觀ルニ、癌死亡率七・〇以上ヲ示ス地方中、東京、和歌山、新潟ニ於テハ三一・七%以下、大阪、山形ニ於テハ三〇・五%、仙臺ニ於テハ二九・七%ニシテ、京都ニ於テハ二九・〇%以下、佐賀及福岡ニ於テハ二七・〇%以下ナリ。但シ、茨城ニ於テハ同O型比率ハ三一・六%ニシテ、千葉ニ於テハ三八・〇%ナリ。

反之、癌腫死亡率ノ五・五以下ナル地方中、鹿兒島ニ於テハ該地方人ノ血液型分布率中O型ノ比率ハ二八・八%ナルモ、秋田ニ於テハ三一・四%ニシテ、北海道、盛岡、青森及沖繩等ニ於テハ同O型ノ比率ハ三四・〇%以上ナリ。

今癌腫死亡率七・〇以上及五・五以下ノ諸地方人ノ血液型分布率中A型及O型ノ比率ヲ圖示セバ次ノ如シ。(第十表)

次ニ本邦各地方人ノ血液型分布率中A型ノ比率ノ四〇・〇%以上ヲ示ス地方ヲ列擧セバ佐賀(九・

第十表



第　九　表

癌死亡率順位	地　方	著　者	人員	O	A	B	AB	人種係數
2	佐賀、長崎	古　市	105	26.4	45.7	17.1	11.4	2.00
3	和歌山	古畑、寺本	1413	31.56	38.64	20.38	9.41	1.61
4	京　都	中島(忠)	509	28.7	41.7	20.2	9.4	1.73
5	新　潟	宮　路	1786	30.23	37.85	22.45	9.47	1.48
6	千　葉	平野、矢島	144	38.0	30.0	22.0	9.0	1.2
8	大　阪	小山田、岸	968	30.5	38.4	23.6	7.4	1.48
11	福　岡	鳥居、深町、古市、權藤	690	26.2	43.3	19.7	10.7	1.77
14	宮城(仙臺)	松原、二宮、三友	1261	29.7	39.2	21.3	9.9	1.57
15	山　形	岸	786	30.5	34.7	26.4	8.2	1.24
16	東　京	白井、中島(忠)石川、平野、矢島、中島	3097	31.29	38.42	21.02	9.27	1.57
17	埼　玉	平野、矢島	123	33.0	40.0	19.0	7.0	1.8
18	茨　城	平野、矢島、岸	276	32.6	36.3	25.3	5.8	1.3
19	長　野	原	353	24.4	40.5	16.0	20.0	1.7
20	石川(金澤)	岸、内藤、市田	1967	28.22	35.49	23.95	12.35	1.32
21	愛　媛	岸	420	28.09	44.76	18.80	8.33	1.95
22	富　山	市　田	551	25.0	39.0	25.0	10.9	1.3
24	岡　山	新谷、岸	828	30.6	39.4	22.5	7.6	1.56
25	熊　本	古　市	130	22.3	47.7	14.6	15.4	2.1
26	山　梨	平野、矢島	79	22.0	39.0	24.0	13.0	1.4
28	神奈川	平野、矢島	124	35.0	33.0	23.0	8.0	1.3
32	岐　阜	岸、河石、古橋	1211	40.96	34.02	19.65	5.37	1.57
33	廣島(吳)	阿　部	353	30.3	38.2	24.4	7.1	1.44
34	香　川	岸	876	29.10	41.09	20.09	9.70	1.70
36	長　崎	田　島	1000	27.9	39.2	22.1	10.8	1.52
38	愛　知	岸、河石、古橋	1264	28.64	39.56	21.52	10.28	1.57
39	高　知	岸	148	30.40	37.83	21.62	10.13	1.51
40	德　島	岸	1265	27.74	40.86	22.76	8.61	1.57
42	秋　田	岸	251	31.4	34.2	24.7	9.5	1.28
43	鹿兒島	岸、古市	285	28.8	37.2	18.9	15.1	1.55
44	北海道	小原、青木、久保、中島(忠)	1419	34.3	35.6	20.4	9.7	1.51
45	岩手(盛岡)	岸	386	34.97	36.78	22.02	6.21	1.52
46	青　森	岸	67	35.8	31.3	22.3	10.4	1.2
47	沖　繩	岸、桐原、白	452	36.7	34.3	20.4	8.6	1.48

第二節　諸外國ニ於ケル癌腫死亡率ト其ノ血液型分布率トノ關係

癌腫發生頻度ガ人種ノ孝異及國土、習慣、氣候等ノ要約ニヨリテ異同ヲ來スモノナラントハ夙ニ先人ノ唱道セル所ナリト雖モ、癌腫發生問題ニ關シ未解ノ點多キ今日、各國間ノ癌腫發生頻度ノ差等ガ何ニ由來スルヤニ就テハ未ダ遽ニ忖度シ得ベカラズ。

サレド余ハ既ニ癌腫ガ血液ノA型ナル者ニ好發シ、同O型ナル者ニ於テ其ノ發生ノ困難ナル事ヲ認メ、地方ニ於ケル血液型分布率ト密接ナル關係ヲ有スル事ヲ知リテ、更ニ是ニ於テ再ビ考索ノ武歩ヲ進メ、此關係ガ諸外國ニ於ケル癌腫死亡率ト其ノ國民ノ血液型分布率トノ間ニ於テモ亦認メラルヽモノナリヤヲ知ラムコトニ努メタリ。

Billing, Barker & Chrisholm 氏等ハ北米合衆國ニ於テハ白人種ノ人口一萬ニ對スル癌腫死亡率ハ二一・七ニシテ黑人種ノ同死亡率ハ一・二ナリト述ベ、又 Sondre 氏ハブラジルニ於テハ人口一萬ニ對シ其ノ癌腫死亡率ハ〇・四一ニシテ歐洲諸國ニ比シテ一定度ノ免疫力ヲ具有スルモノトシ、更ニ白人間ニ於テモ其ノ故國ノ差別ニヨリ癌腫發生頻度ヲ異ニスト論ゼリ。又 Hoffman 氏ニ依レバ北米印度人間ニ於テ癌腫患者ヲ見出ス事ハ極メテ稀ナリト言フ。其他同一地方ニ居住スル各民族間ニ於ケル癌腫死亡率ヲ比較セル報告尠カラズ。

今世界諸國ニ於ケル癌腫死亡率(Hoffman 氏ニ據ル)ヲ其ノ高低ノ順位ニヨリテ配列スレバ次ノ如シ。(第十一表)。

第十一表(a)

歐羅巴國名	死亡率對スル癌腫人口十萬ニ
丁抹	142.1
瑞西	124.3
和蘭	106.4
スコツトランド	103.0
瑞典	98.3
イングランド	97.6
諾威	95.6
露國	90.6
獨逸	87.1
アイルランド	81.2
墺國	80.0
佛國	78.4
波蘭	72.3
フンランド	68.8
白耳義	66.9
伊太利	65.2
ルーマニヤ	61.5
西班牙	52.3
希臘	51.9
洪牙利	45.5
セルビヤ	35.9
土耳古	34.8
スロベキヤ	28.5
アイスランド	24.8
葡萄牙	22.4

三)、京都(八・一)、福岡(七・四)、埼玉(六・九)、長野、(六・九)、愛媛(六・八)、熊本(六・六)、香川(五・九)及德島(五・五)等ニシテ該地方ノ癌腫死亡率ヲ觀ルニ香川及德島ヲ除キ、他ノ地方ノ癌腫死亡率ハ總テ日本人癌腫平均死亡率(六・六)以上ヲ示セリ。反之、其ノ血液型分布率中A型ノ比率ノ低キ地方即チ三七・五%以下ヲ示ス地方ヲ列擧セバ沖繩(三・六)、青森(四・一)、岩手(四・三)、北海道(四・五)、鹿兒島(四・六)、秋田(五・〇)、岐阜(五・九)、神奈川(六・二)、石川(金澤)(六・九)、茨城(六・九)及山形(七・〇)及千葉(八・〇)等ニシテ、此等ノ中ヨリ石川、茨城、山形、千葉等ヲ除外セバ、他ノ地方ノ癌腫死亡率ハ何レモ日本人癌腫平均死亡率(六・六)以下ヲ示シ、更ニ神奈川ヲ除外セバ、其他ノ地方ノ癌腫死亡率ハ總テ六・〇以下ナルヲ認ム。

又血液型分布率中O型ノ比率ノ三四・〇%以上ヲ示ス地方ヲ列擧セバ千葉(八・〇)、北海道(四・五)、盛岡(四・三)、青森(四・一)、沖繩(三・六)等ニシテ、千葉ヲ除外セバ、他ノ地方ノ癌腫死亡率ハ四・六以下ナリ。反之、同O型ノ比率ノ二七・〇%以下ヲ示ス地方ヲ列擧セバ佐賀(九・三)、福岡(七・四)、長野(六・九)、富山(六・七)、熊本(六・六)、及山梨(六・四)等ニシテ該地方ノ癌腫死亡率ハ山梨ヲ除キ、總テ日本人癌腫平均死亡率(六・六)以上ナリ。

要之、本邦各地方ノ癌腫死亡率ノ高低ハ該地方人ニ於ケル血液型分布率中特ニA型及O型ノ比率ノ昇降ト一定ノ關聯アルモノノ如クニシテ、此ノ事實モ亦余ノ癌腫發生ニ關スル想定ヲ擁護スルモノト言フヲ得ベシ。

抑本邦ハ島國ニシテ地域比較的狹小且ツ居住スルモノ、多クガ同一種族ナルニモ拘ラズ各地方相互間ニ於テ其ノ癌腫死亡率ニ相違アリテ、既ニ周知ノ事實ナルニモカ、ハラズ、未ダ之レニ關シテ妥當ノ說明ヲ試ミタルモノアラズ。

サレド癌腫發生ノ素因ガ濃淡種々ノ密度ヲ以テ血液型ニ纏絡ステフ余ノ想定ニ據リテ之レヲ觀レバ、各地方ニヨリテ其ノ住者ニ於ケル各血液型ノ分布率ノ相異アル以上、其ノ癌腫死亡率ノ各地方ニヨリテ夫レ夫レ亦相異ナルハ敢テ必ズシモ奇異ニアラズ、寧ロ當然ナリト稱スベキニ似タリ。

其後 Ottenberg 氏ハ Hirschfeld 氏ノ生物學的人種係數ノ大小ニ依リテ三大別セラレタル人種型ガ歐洲地方ニ於ケル種族分類ニハ適スルモ米國土人等ニハ適用スル事不可能ナリト論述シ、同氏ハ血液四型ノ分布狀態ニ依リ六型ニ分類セン事ヲ提唱セリ。卽チ

(一)歐羅巴型。瑞典人、諾威人、伊太利人、佛國人、丁抹人、獨逸人、獨逸系猶太人、墺國人、ブルガリヤ人、ゼルビヤ人、希臘人、英國人。

(二)中間型。アラビヤ人、土耳古人、露國人、西班牙系猶太人。

(三)湖南型。日本人、南部支那人(湖南省)、洪牙利人、「ルーマニア」系猶太人。

(四)印度滿洲型。朝鮮人、滿洲人、北部支那人、ジプシイ(洪牙利)、印度人(ヒンヅー)。

(五)亞弗利加南亞細亞型。黑人(セヂガル、米國黑人、マダガスカル人、スマトラ人、スマトラ支那人、ジヤワ人。安南人。

(六)太平洋亞米利加型。北米印度人、濠洲土人、アイルランド土人、フヰリッピン土人。

同氏ハ更ニ以上ノ六分類型ヲ(O型、A型、B型ノ比ヲ)作圖シ、之レヲ Ottenberg 氏血液型圖トシテ發表セリ。余ハ此ノ Ottenberg 氏分類ノ六型ヲ其ノA型ノ比率ノ高低ノ順ニ配列シ、之レト其ノ人種型ニ屬スル各國民ノ癌腫死亡率トヲ對比セリ。(第十二表、但シ、太平洋亞米利加型ハ特ニO型ノ比率大ナルガ故ニ最後ニ置ケリ。

卽チ血液型分布率中A型ノ比率ノ最高ナル歐洲型ノ諸國民ニ於テハ癌腫ノ死亡率モ亦最高ニシテ、同A型ノ比率ノ第二位ナル湖南型ニ屬スル國民ニ於テハ其ノ癌腫ノ死亡率モ亦略ミ第二位ナリ。前二者ニ比シ同O型ノ比率ノ比較的高ク、反之同A型比率ノ低キ中間型ニ屬スル國民ニ於テハ更ニ其ノ癌腫死亡率ノ下降セルモノアリ。更ニ同A型比率ノ低ク、同O型ノ比率ノ高キ亞弗利加南亞細亞型ニ屬スル國民ニ於テハ其ノ癌腫死亡率ハ更ニ低シ。又同A型ノ比率ノ低キ

同（b）

オーストラリヤ及布哇 國名	死亡率對スル癌腫人口十萬ニ
ニュージランド	75.2
オーストラリヤ	74.3
布哇	38.2
フィージイ島	4.2

同（c）

北米及南米 國名	死亡率對スル癌腫人口十萬ニ
ベルー	118.8
西印度島(丁)	118.0
ギヤナ(蘭)	95.6
コロンビヤ	89.7
合衆國	74.7
ウルガイ	66.0
アルゼンチン	64.0
カナダ	62.0
エクアドル	61.0
サルバドル	58.2
ベルムダ	56.0
ニューファンドランド	51.6
メキシコ	49.5
キューバ	44.6
コスタリカ	40.6
チリー	35.6
ブラジル	33.5
ボリビヤ	21.8
西印度島(英)	20.9
ギヤナ(英)	18.2
ポンヂュラス(英)	14.7
ペ子セラ	14.7
ニカラガ	10.6

同（d）

亞細亞 國名	死亡率對スル癌腫人口十萬ニ
日本	60.2
フィリッピン諸島	27.3
マニラ	25.4
シンガポール	12.6
印度	11.7
ペナン	10.3
香港	8.1
セイロン島	5.6

同（e）

亞弗利加 國名	死亡率對スル癌腫人口十萬ニ
ケープ洲	56.2
トランスバール	34.4
歐洲人	51.9
黒人	14.5
アルジェリヤ	34.1
ナタル州	32.9
歐洲人	62.0
印度人	10.3
シェラレオ子	13.2
マウリチウス	9.3

即チ、第十一表ヲ觀ルニ、癌腫死亡率ハ世界諸國間ニ於テ顯著ナル差異ヲ示ス。

Hirschfeld 氏ハ生物學的人種係數ニヨリテ世界ノ民族ヲ三大別シ、一・〇以上ノ係數ヲ現ハス民族ヲ歐羅巴型トナシ、一・三以下ノ係數ヲ有スル民族ヲ亞細亞亞弗利加トナシ、一・〇ヨリ一・三ノ間ノ係數ヲ現ハス民族ヲ中間型トセリ。

卽チ玆ニ於テモ亦余ノ想定ノ的中セル事ヲ知レリ。而モ本節ニ於テハ其ノ國土ニ於ケル癌腫死亡率ト其ノ國民ニ於ケル血液型分布率トノ間ノ密接關係ガ本邦各地方ニ於ケルヨリモ更ニ明劃ニ現ハレタルガ如キ感アリ。

第六章　總括及ビ癌腫ト素因

余ハ癌腫患者ニ於ケル血液型ノ分布狀態ヲ調査シテ其ノ比率ノ高低ヲ健常人ニ於ケル同分布狀態ト比較シタリ。癌腫患者ニアリテハA型ノ比率著シク昇リ、AB型之レニ次ギ、B型ニ於テハ僅ニ昇リ、O型ニ於テハ著シク低下シテ、健常者ニ於ケル血液各型ノ比率高低ノ順位ガ A＞O＞B＞AB ナルニ對シテ A＞B＞O＞AB ナルコトヲ知レリ。是ニ於テ余ハ癌腫ハ其ノ血液型ノA型ナル者ニ好發シ、其ノAB型ナル者ニ於テハ發生ノ困難ナルモノナルベキヲ想定セリ。

余ハ更ニ此ノ成績ト同一見地ヨリセル諸家ノ研究トヲ比較對照シ、諸家ノ業績ニ於テモ亦慨チ余ノ想定ノ適用シ得ベキヲ知レリ。

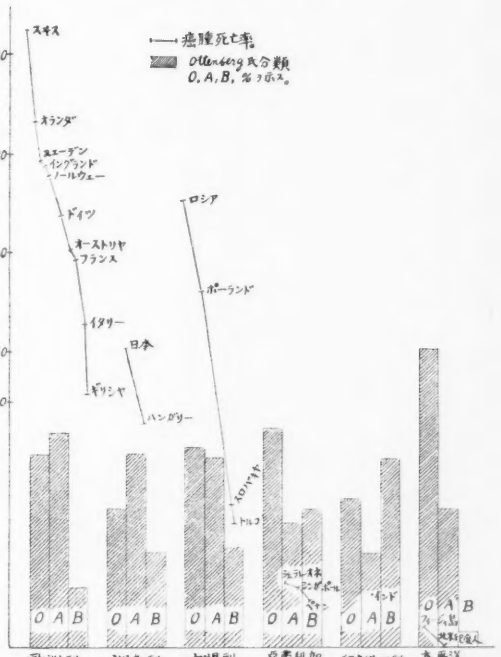
余ハ更ニ本邦各地方ノ癌腫死亡率ト各地方人ニ於ケル血液型分布率竝ニ世界諸國ニ於ケル癌腫死亡率ト諸國々民ニ於ケル血液型分布率トノ關係ヲ調査シタリ。而シテ是等ノ場合ニ於テモ亦余ノ想定ノ謬ラザルヲ知レリ。

諸種ノ癌腫ガ外的原因ノミニヨリテ發生スルモノニハアラズシテ內的素因ノ應援ト相俟チテ初メテ發生スルモノナルベキハ現今一般ニ信ゼラル、所ナリ。サレド其ノ內的素因ノ存在ト性狀トニ就キテハ單ニ類推ニヨリテ漫然揣摩憶測セラル、ニ過ギズ。

余ガ本研究ノ成績ニヨレバ、癌腫發生ノ內的素因ノ存在ハ學問的ニ確實ナリト謂フベク、ソガ血液各型トノ間ニ示ス所ノ濃淡種々ノ關係ヨリシテ略ミ其ノ性狀ノ髣髴ヲ知ルコトヲ得ベシ。

蓋シ、癌腫發生ノ內的素因ナルモノガ恐ラク化學的反應又ハ理學的作用若シクバ兩者ノ連接シタルモノナルベキヲ

第十二表



ルニ、一般ニ北方ノ諸國ニ高ク、南方ノ諸國ニ比較的ニ低キ事及ビ是等諸國々民ノ血液型分布率ニ於テモA型ノ比率ガ一般ニ北方ノ諸國々民ニ高クシテ、南方ヘ行クニ從ヒ同A型ノ比率ノ低下スル傾向ヲ有スル事等ヲ比較考察スルニ、此ノ事實ハ極メテ興味深キモノト稱スベシ。

要スルニ、世界諸國ニ於ケル癌腫死亡率ト其ノ住者ニ於ケル血液型分布狀態トヲ對比シテ觀察スルニ、其ノ血液型分布率中A型ノ比率ノ高クシテ且ツ同O型ノ比率ノ比較的低キ國民ニ於テ其ノ癌腫死亡率ノ比較的ニ高キ事ヲ認ム。

印度滿洲型ニ屬スル印度人ノ癌腫死亡率ハ更ニ低シ。又同O型ノ比率ノ顯著ニ高キ大平洋亞米利加型ニ屬スル北米印度人ニ於テハ癌腫發生ハ稀ナリト Hoffman 氏ハ報告セリ。

更ニ南米、北米兩大陸ヲ通ジ、其ノ各國民間ニ夫レ夫レ其ノ癌腫死亡率ノ高低及ビ異同アルハ恐ラク其ノ血液型分布率ヲ異ニスル民族ガ各地方ニヨリ其ノ數ヲ異ニスルガ爲ナラン。

又歐洲諸國ノ癌腫死亡率ヲ觀

Zentralb. f. Chir. Nr. 48. 1927. 8) **藤浪鑑**, 日新醫學. 第2年. 第7號. 大正2年. 9) **古畑種基**, 日本醫事新報. No. 336, 昭和4年. 10) **福田保**, 醫事公論. No. 875, 昭和4年. 11) **深町, 穂積**, 社會醫學雜誌. No. 482. 昭和2年. 12) **古畑, 岸**, 第三回大平洋學術會々誌. 1926. 13) **權藤, 竹藏**, 中外醫事新報. No. 1083, 大正14年. 14) **本田蘭**, 癌. 第17年. 第1册. 大正12年. 15) **F. Hoffman**, The Mortality from Cancer throughout the World 1915. 16) **飯塚實**, 癌. 第10年. 第1册. 大正5年. 17) **市田要吉**, 十全會雜誌. 第32卷. 第8號. 18) **H. Kusama**, 癌. 第22年. 第3册. 昭和3年. 19) **岸孝義**, 十全會雜誌. 第33卷. 第11號. 昭和3年. 20) **宮路重嗣**, 治療及處方. 大正13年. 21) **中田秀全**, 十全會雜誌. 第33卷. 第5號. 22) **中曾根吉次**, 成醫會雜誌. 第46卷. 第4號. 昭和2年. 23) **中島精**, 臨牀產婦人科. 第3卷. 第2號. 24) **中島精**, 第26回婦人科學會. 昭和3年. 25) **長與又郎**, 日本醫事新報. No. 346. 昭和4年. 26) **內藤榮治**, 十全會雜誌. 第33卷. 第5號. 昭和3年. 27) **小原正生**, 大阪醫學會雜誌. 第21卷. 大正11年. 28) **Ottenberg**, J. of Am. M. Ass. Vol, 84. No. 19. 1925. 29) **王丸勇**, 神經學雜誌. Vol. 29. No. 1. 昭和3年. 30) **瀧野憲照**, 東京醫事新誌. No. 2558. 昭和3年. 31) **田島清**, 東京醫事新誌. No. 2558. 昭和3年. 32) **寺本太郎市**, 北越醫學會雜誌. 第43卷. 第4號. 昭和3年. 33) **山極勝三郎**, 日本病理學會々誌. 大正5年. 34) **吉田寬一**, 社會醫學雜誌. No. 495. 昭和3年. 35) **I. Furuhata**, Jap. med. W. Vol. III. No. 11. 1928.

推定シ得ベケレバナリ。

第七章　結　論

(一)癌腫患者ニ於ケル血液各型ノ分布ハ健常者ニ於ケル同分布率ニ比シテ其ノ趣ヲ異ニシ、各型分配率ノ高低ノ順位ガ健常者ニ於テA＞O＞B＞ABナルニ反シ、癌腫患者ニ於テハA＞B＞O＞ABナリ。此ノ相異ハ癌腫ガA型血液者ニ著シク多ク、O型血液者ニ比較的少キニ基ヅク。

惟フニ、癌腫ハ何レノ血液型ノ者ニ於テモ發生シ得ルモ、就中其ノA型ナル者ニ好發シ、AB型ナル者ニ於テハ其ノ發生ノ最モ困難ナルモノヽ如シ。

血液型ト癌腫發生トノ間ニハ明ラカニ密接ノ關係アリト言フベシ。

(二)日本ノ各地方及ビ外國ニ於ケル癌腫死亡率ノ高低ト其ノ地方若シクハ其ノ國ノ住民ニ於ケル血液各型ノ分布率トヲ對照スルニ、余ガ想定ハ是ニ於テモ亦タ齟齬スルコトナシ。

(三)癌腫發生ノ内的素因ノ存在ハ從來類推揣摩セラレタルニ過ギザレドモ、其ノ存在ハ學問的ニ確實ナリト謂ツベシ。

擱筆ニ臨ミ不斷ノ鞭撻ト校閲ノ勞ヲ忝フセル恩師川上教授ニ對シ、又多大ノ援助ヲ辱ウシタル本學病理學教室ノ同僚、本學外科學教室ト産婦人科學教室トノ諸氏、赤羽橋濟生會病院外科及産婦人科醫局員諸氏ニ對シ、玆ニ記シテ感謝ノ意ヲ表ス。

主要文獻

1) **W. Alexander,** Brit. J. of Exp. Path. Vol. 2, 1921. 2) **新谷二郎,** 臨牀産婦人科, 第4卷, 第2號, 昭和4年. 3) **J. Bauer,** Die Krebskrankheiten 1925. 4) **Buchman, J. Arthur, Higley, Edith,** Brit. J. of exp. Path. Vol. 2, 1921. 5) **大道直一,** 岡山醫學會雜誌, 第49年, 第2, 6第. 6) **大道直一,** 皮膚科泌尿器科雜誌, Vol. 28, No. 3, 昭和3年. 7) **Elnandi,**

腫瘍ハ非常ニ密集セル紡錘形細胞ヨリ成リ、周圍ノ結締組織、脂肪組織、筋肉ニ浸潤セリ。

細胞核ノ太サハ不同ニシテ、所々ニ二個或ハ數個ノ核ヲ有スルモノアリ、斯ル細胞ハ屢〻多少橢圓形ヲトレルアリ。細胞間質ノ發育ハ極テ輕微ナリ、斯ルガ故ニ上皮性細胞ナリト確認シ得ルモノナク、紡錘形細胞肉腫ト診斷セリ。

他ノ諸器官、卽チ淋巴腺、肺臟等ヲ檢鏡セルニ何レニモ轉移ハナシ、只ダ脾臟ニノミ明確ナル限界ヲ缺ゲル白色ノ小結節アリシモ其ノ本質ハ不明ナリ、卽チ鏡下所見ハ、胎生時紡錘細胞ヲ伴フ結締織ヨリナリ、可成リ多數ノ巨態細胞ヲ有ス、此ノ巨態細胞ハ中心部ニ數個ノ核ヲ有セリ、診斷、單純梗塞組織化？(或ハ肉腫轉移？)

腫瘍ノ一部ヲ嚴密ニ無菌的ニ切除シ、五匹ノ健常まうすニ移植セリ、サレド恐ラクハ化膿ニ因ルナランカ何レノ移植モ成功セザリキ。

腫瘍ノ他ノ一部ヲ細碎シ、ベルケフェルド氏濾過器ヲ用ヒテ濾過シ、其ノ濾液ヲ多數ノまうすニ注射セリ、其ノ結果ハ陰性ナリキ。

○抄　錄

約言スルニ、硬性癌樣ニ始マリシ腫瘍ハ肉腫ニ終レリ、此ノ事實ハ先論文ニ主張セシ「結締組織ハ癌細胞ノ浸潤ニ對シ障壁ヲ形成ス」ト云フ意見ニ抵觸セリ、確カニ此ノ場合ニハ、結締織ハ自己ニ委チラレタル保護作用ヲ却ツテ滅失セルナリ。

癌ガ斯ル發育ヲナセルハ甚ダ興味アル事實ニシテ—此レニ相似ノ事實ハ未ダ嘗テ學界ニ報告ナシ、譯者曰ク癌腫ガ移植經過中紡錘細胞肉腫樣ニ變化セル報告ハ既ニ屢〻アリタリ—幾多ノ理論的論爭ヲ喚起セシムルニ足ル。然レドモ余ハ今唯〻新事實ヲ提示スルニ止メ(後日再ビ問題トスルコトアルベシ)、新研究ノ論述ニウツラン。

次ニ以上ヨリ誘導サレシ問題ハ後述ノ如シ。何ガ故ニ若干ノまうすニノミ火傷ヨリ癌發生セシヤ？又何等カノ方法ニヨリテ火傷癌ノ發生シ易キ狀態ヲ附與シ得ルヤ？

上述急性癌ニ罹リシまうすハ全ク幼若ナルモノナリシガ故ニ、幼若動物ヲ用フレバ同一ノ結果ヲ得ルヤモ知レザルヲ以テ新シク用ヒタルまうすハ生後約一ケ月ノモノ十六匹ナリ、其等ノ十二匹ハ火傷ヲ受ケテ後十二ケ月ヨリ十六ケ月迄生存シタレドモ其ノ何レニモ癌發生ヲ認メザリ

抄　錄

てーる癌ト「瘢痕癌」トノ比較小論竝ビニ後者研究ノ補遺

Fridtjof Bang (de Copenhague)

Bulletin de l'association française

(Tome XVII–No. 9–Décembre 1928)

久保久俊譯

本誌一九二五年四月號ニ、余ハ外傷或ハ瘢痕ヨリノ癌ニ就キテ、臨牀上竝ビニ實驗上ノ若干例ヲ發表セリ。其ノ中臨牀例ハ九ニシテ此レヲ二群ニ分チタリ、卽チ第一群ニハ皮膚ノ偶發性損傷ヨリ幾許モナクシテ癌發生シ——外傷ヨリノ急發性癌——、第二群ハ偶發性外傷ガ瘢痕化シ數年後ニ癌發生セリ——瘢痕ヨリノ潛伏性癌。

加之、加熱セル硝子棒ニ依リ皮膚ニ火傷ヲ惹起セシメタルまうすノ若干群例ノ研究ニヨル成果モ說述セリ。其ノ一例ニハ(幼若ノ一例)第三週日中ニ瘢痕部腫瘍發生セリ、其ノ切除標本ニヨレバ、硬性癌樣ノ有棘形細胞癌ナリキ。他ノ一例(六十一番ニハ火傷後一年五ケ月ニシテ瘢痕ニ乳嘴腫發生シ、其レヨリ數ケ月後ニ鼠ハ斃レタルガ檢鏡セルニ癌ノ初期ナリキ。

同事實ニ就キテ更ニ進捗セル研究ヲ述ブルニ先ダチ、余ハ問題トナリシ百四十六番まうすノ腫瘍ニ就キ記述セン。

一九二五年三月ニ腫瘍ハ侵蝕性潰瘍樣ノ損傷ヲ形成シテ永ラク其ノ狀態ニ止リヌ。然ルニまうすハ創面ヲ絕エズ搔囓セル爲創面ヨリ屢〻出血シ遂ニハ漸次著シキ貧血ニ陷レリ。一九二五年五月ノ初旬潰瘍ハ急速ニ擴大シ、周邊部ハ腫脹シ、數日後ニハ全體トシテ10×4糎ノ潰瘍性腫瘍ヲ形成シ、周圍ノ皮膚ニハ浸潤ヲキタセリ、但シ體毛ハ尙ホ殘存セリ。

一九二五年五月七日ニ動物ヲ殺シ檢索セルニ次ノ如キ結果ヲ得タリ。

る塗擦セル部ニ迄到達シ、此ノ部ニ於ケルモノハまうすノ斃レシ時ニハ（一九二五年十一月四日）約小豌豆大ナリキ。

檢鏡セルニ次ノ如キ所見ヲ得タリ。

（a）項部腫瘍ハ扁平細胞ト紡錘形細胞ヨリ成ル。腫瘍ノ若干部位、殊ニ表面ニ近キ部ニ於テハ扁平細胞ガ多數ニシテ、明瞭ナル角化（癌球）ヲ有スル小島ヲ交ユ。他ノ部位特ニ深部ニ於テハ紡錘形細胞ノミニテ、所々ニ多數ノ核ヲ有スルモノアリ。此ノ部ニハ角化ノ存在認メ得ズ。

周邊部ニ浸潤セル細胞ハ、結締組織竝ビニ筋肉層ニ浸徹セリ。診斷、紡錘形細胞肉腫ヲ合併セル有棘細胞腫？

（b）てーるヲ塗擦セル部位ニ發生セル腫瘍ハ著シキ角化ヲ呈スル扁平細胞ヨリ成リ、皮下組織ニ浸潤セリ、診斷、有棘細胞癌。

余ハ此ノ二ツノ癌ハ實ハてーる癌ナリト推定ス。動物ガ種々ナル動作ヲセントスルヤ前肢ヲ以テ耳ノ前方ヲ摩擦スルハ最モ屢〻行フ動作ノ一ニシテ、尚ホ此ノ輕捷ナル小動物ガ體ヲ曲ゲ前肢或ハ舌ヲ以テ、てーる塗擦部ヲ綺麗ニスルハ最モ容易ナル動作タルコトハ疑ヲ容レズ。從テ余ハコノ項癌ハ燒灼セシ部位ノ附近ニ發生シタレドモ實ハ火傷癌ニ非ズシテ、まうすノ前肢ヲ以テ薦骨部ヨリ頭部或ハ項部ニ運ビシてーるニ依ルモノナラント思考ス。夫レニモ關ラズ此ノ實驗ハ同一まうす二箇ノ癌引續キ發生シタル好適例トシテ興味ヲ有ス。

他ノ例ハ通常ノてーる癌ニ過ギザレド、此ノ報告ノ完全ヲ期スル爲ニ以下其ノ經過ヲ述ブ。第百三十九番まうす一九二四年九月二十二日ニ肩胛骨間ヲ燒灼シ、同日てーる塗擦ヲ始メ一九二五年一月十七日ニ終レリ。

燒灼後ノ瘢痕ハ平滑ニ止レリ。同年十二月十五日ニ塗擦部ニ浸潤ヲ觸レ、二六年二月二十六日腫瘍ハ發生、成長シ動物ノ斃レタル二六年四月二十五日ニハ定型的有棘細胞癌ヲ形成シタリ。

是等ノ實驗ヨリ觀ルニ幼若まうすハ火傷癌ニ對シテ著シキ素因ヲ有スルモノニ非ズ、又斯ル素因ハてーる塗擦ニ依リ將來シ得ラルヽモノニハ非ザルハ確實ナル如シ。

併シ屢〻此ノ結論トハ相容レザルガ如キ若干ノ研究アリ。其ハ Leiv Kreyberg 氏報告ニシテ、氏ハ殆ド上記同樣ナル條件ノモトニ行ヘル一三實驗ニ於テ若干、まうすニ

キ。

次ニてーるノ全身中毒ニ依リ火傷癌ヲ起シ易キ狀態ヲ動物ニ附與シ得ザルヤヲ見ント試ミタリ。まうすハ殆ド全身ヲ、殊ニ尾根ノ近クハ一層容易ニ舐ムルコトヲ得。サレド此ノ部ヲ後足ニテ觸レ此ノ部ノてーるヲ肩胛骨間ニ運ブ能ハザルヲ以テ、薦骨部ニてーるヲ一週ニ三回、四ケ月間塗擦セリ。實驗ノ條件ハ次ニ述ブルガ如シ。

（一）五匹ノまうすニ四ケ月間てーるヲ塗擦シ、次ニ肩胛骨間ヲ燒灼セリ。

火傷後生キ殘リシモノハ

百七十二番　一月
百六十八　〃　六月
百六十九　〃　十月
百七十　〃　十三月
百七十一　〃　十五月

而シテ其一匹ニノミ二ケ所ニ相踵ギ癌發生セリ（百六十九番下述參照）

（二）四匹ハ肩胛骨間部ヲ燒灼セリ、同時ニ四ケ月間てーるヲ塗擦セリ。

火傷後生キ殘リシモノ

百四十二番　十二月
百三十九番　十九月
百四十番　十九月
百四十四番　二十月

何レニモ火傷性癌ハ認メザリシモ、一疋ニ於テてーるヲ塗擦セシ部位ニ一箇ノ癌發生ヲ見タリ（百三十九番下述參照）

（Ⅲ）四匹ハ肩胛骨間部ヲ燒灼シ、同時ニ四ケ月てーるヲ塗擦シ、次ニ該塗擦部ヲ燒灼セリ。火傷後生キ殘リシモノノ期間ハ十二乃至二十ケ月。ナリ癌發生シタルモノハナシ。卽チ上記ノ實驗ニテ二匹ニ癌發生セリ。百六十九番ト百三十九番ナリ。

百六十九番ノ鼠ハ、一九二四年九月十九日てーるヲ塗擦シ始メ、一九二五年一月十七日中止、肩胛骨間ヲ燒灼セルハ一九二五年一月十日ナリ。然ルニ二五年三月六日右耳ノ近クニ二個ノ乳嘴腫ヲ認メタリ。てーる塗擦部ハ永ラク平滑ニ止リ、乳嘴腫ハ成長シ間モナク融合シ一九二五年十一月四日ニハ殆ド榛實大ニ達セリ、十一月腫瘍ハてー

例ヲ想起セバ思ヒ半バニ過グ。從ツテ結核菌ハ或ル意味ニ於テ、結核性瘢痕ノ癌腫化ニトリ重要ナルヲ推定セシム、此ノ推論ト一致シテ、偶發性外傷竝ビニ瘢痕ヨリノ癌ニ對シテハ未知ノ病原菌ニ同一ノ役割ヲ歸セシムルヲ得ベシ。

最近コノ疑問ノ解明ニ資スルニ足ル臨牀上竝ビニ實驗上ノ新シキ研究行レタリ。

卽チ René Huguenin ハ本誌(一二五年七月)ニ石油殘渣ニ因リ火傷ヲ起シ、其ニ次デ發生セル急性癌例ヲ發表セリ。石油殘渣ノ數滴ヲ滴下セシヨリ約一週間ニシテ已ニ、硬キ微細ナル丘疹ガ滴下セル部卽チ右手背面ニ出現セリ、一ケ月半後ニ鏡檢セルニ有棘細胞上皮腫ナリキ。此ノ例ハ他ノ著者ニ依リテ(一三年二月號)發表セラレタル「一職工ニ於ケルてーるヨリ發生セル急性癌」ト著シク相似タリ。癌ハ鼻口ニ發セリ。

且又 Roussy, Sorton, Perrot 等ハ(一二十七年六月號)火傷後二十八年ヲ經タル陳舊性火傷瘢痕ニ發生セル前膊ノ上皮腫ノ一例ヲ發生セリ。又 F. Ladreyt 氏ハ本年四月ニ余ガ先述セル例ト幾多ノ點ニ於テ相似セル偶發性皮膚外傷ヨリ發生セル癌ノ數例ヲ公表セリ。

以上ハ、恐ラクハ非常ナル興味ヲ提供スル最近ノ實驗的研究ナリ、旣ニ E. L. Kennaway, Leiv, Kreyberg 氏ノ實驗報告ヲ述ベタリ、次ニ吾々ノ實驗ト直接關聯セル他ノ二三ノモノニ就キ述ベン。先ヅ G. Marschall Findlay ノ研究ヲ紹介スベシ。氏ハ加熱セルてーるヲ七十五匹ノまうす背ニ塗擦シ、其レヨリ約一年後三匹ニ癌發生ヲ認メタリ。

次ニ是等ノ觀察ト對照ヲナスモノハ、Kotzareff De Morsier 氏ハ電解セルてーるヲ以テ兎ノ耳ニ塗擦シ其ヨリ十六乃至十九日ニシテ已ニ癌ヲ發生セシメ得シコトナリ。終リニ A. Babes, Mlle Serbanesco 氏等ハ兎ノ耳ノ內面ニてーるヲ塗擦シ同時ニ同部ヲ摩擦シ、同樣ノ結果ニ到達セリ、極ク最近同氏等ハ再ビ化學的影響ト同時ニ機械的影響ノ重要ナルヲ主張セリ。Raposo 氏ニ據レバ、Kotzareff 氏ノ方法ニヨル癌腫化ニ於ケル重要ナル役割ヲナスハ加溫法ナリト。但シ此ハ常ニ成功スルトハ考ヘラレズ(Anardi)

瘢痕性癌ノ種々ノ報告例ハ何レモ細胞狀態ハ同一ニシテ、癌ハ再生中或ハ再生セシ組織ニ、換言スレバ細胞分剖ヲ

火傷瘢痕ヨリ乳嘴腫ヲ惹起セシメ得タリ。但シ對照動物ニハ認メザリキ。併シ此ノ場合ニモ余ガ百六十九番例ニ於テ述ベシ見解ガヨク適用サル、卽チまうすガてーる塗擦セラレシ部位ヨリてーるヲ火傷部ニ運ビシヤモ知レザル可能性ヲ完全ニ否定シ得ザレバナリ。而モ彼ノ研究業績中ニハ充分吾々ノ注目ニ値スルモノアリ、尙ホ斯ル意義ニ於テコノ方面ノ決定的研究ガ望マシ。

實驗的ニ火傷癌ヲ此ノ二例ノミニ作リ得タルニヨリ、白まうすニ此ノ癌ヲ如何ナル率ニ於テ惹起セシメ得ルカヲ知ルハ重要ナルト思考セリ。

此ノ目的ノ爲メニ、百匹ノまうすニえーてる麻醉ヲ施シ燒灼セリ(一五年四月二十一日)、初期ノ死亡率ハ非常ニ著シク、二十八匹ノミ火傷後六ケ月間生キ殘レリ、其ノ二十八匹中八匹ハ火傷後八ケ月間、二匹ハ十ケ月間、三匹ハ十二ケ月間、六匹ハ十六ケ月間以上生キ延ビタリ、但シ何レニモ癌ハ認メザリキ。

此ノ實驗ヨリまうすノ火傷癌發生ハ人間ニ於ケルト同ジク、甚ダ不定(氣紛レ)且ツ吾人ニ未知ナル條件ニ基クモノニシテ、コノ條件ヲ究明解決スベキナリ。

サテ次ギニ瘢痕癌ニ就キ二三ノ注意事項ヲ述ベン。

嚴密ナル意義ニ於テ、瘢痕性癌トイフハ皮膚ノ偶發性組織連續離斷後ニ瘢痕ヲ生ジ、其レヨリ發生セルヲ意味スルモノナル可シ、サレバ之ニ對シ治癒セザリシ偶發性外傷ノ組織連續離斷ヨリ直接ニ發生スル癌ノ一種存在スルコトヲ吾々ハ知レリ。

火傷ガ恐ラクハ未知ノ化學的物質ノ成生ニ因リ癌ノ始源ニ對シ特殊ナル重要性ヲ正シク有スル部位ニ於テ一ツノ契機ヲ爲スト雖、火傷性瘢痕ヨリ發生スル癌ハ久シキ以前ヨリ認メラレタリ、斯ル觀點ヨリシテハ E. L. Kennaway ガてーる生成物ヲまうすニ塗擦シ、十二例ニハ癌ヲ、八例ニハ乳嘴腫ヲ發生セシメ得ルニ到リシハ非常ニ興味アルコトナリ(全まうすハ五十匹ナリキ)。火傷性癌ハてーる性癌ト同種類ト考ヘルコトヲ得。

夫ノ結核性或ハ狼瘡性瘢痕部ニハ上皮細胞ハ分裂シ屢〻其ハ非常ニ著シクシテ、增殖而モ乳嘴腫樣ノ增殖ヲ來シ、或ハ往々癌性變化現ル、爾他傳染病ノ感染病後ノ瘢痕ニ斯クノ如キ癌發生ノ傾向ノ認メ得ラレシモノハナシ。例ヘバ種痘性瘢痕ヨリ上皮ノ癌腫性樣增殖ヲ認メザリシ夥シキ

匹ニ癌樣ノモノ發生シ、十四匹ニハ一ケ月間塗擦セル結果ハ陰性ナリ。

併レドモ他ノまうす群ニ於テハ動物ノ生時及ビ死後テーる塗擦セル部ノ試驗的切除片ヲ連續標本ニテ檢査セルニ次ノ如シ。

第一表

塗擦後	第一ケ月	第二ケ月	第三ケ月	第四ケ月	第五ケ月
單純性增生	7例	11例	6例	14例	3例
初期癌	0	0	3例	2例	3例
合計	7例	11例	9例	16例	6例

卽チ六匹ノ試驗まうすニハ第五ケ月ニ三匹ニノミ組織學的癌發生シ、第四ケ月ニ於ケル十六匹ニハ二匹ニミ同樣ナル結果ヲ得タリ、而ルニ四ケ月テーる塗擦セルモノニハ必ズ、又三ケ月塗擦セルモノニハ殆ド癌發生セリ、是等ノ成績ハ乳嘴腫ノ自家移植後癌ニ變性セルヲ認メタルArch. Leitch, Murray, Woglom 氏等ノ報告ト一致ス。

第一表ニ成績ヲ示セルまうす群ニハ急性癌發見ヲ特ニ目的トセル爲皮膚ノ浸潤證明サレ得ルヤ直チニ試驗的切除ヲ行ヘリ。第三ケ月內ニ早期性癌三例證明セリ（第七十五日、第七十七日、第九十日）卽チ是等まうすハ特殊素因ヲ有セルナリ。

潛伏期トハテーる塗擦ニ依リ細胞ガ生物學的ニ惡性ヲ帶ブルニ到リシヨリ、塗擦ヲ中止シ浸潤性發育ノ始マル迄ノ期間ヲ余ノ命名セル處ナリ、最モ永キ潛伏期ハ八ケ月半ナリキ。

第一群ノ癌例ヲ次ノ表ニ要略セリ。

コノ表ニ見ル如ク癌發生時ノ最モ長期ヲ要セルハ二ケ月間塗擦セルまうすニシテ、ソノ中ノ一例ニハ八ケ月半ヲ要セリ、（二百四十八番）、塗擦日數長キ他群ニテハ、ヨク短期間中ニ癌發生スルヲ以テ、ソレヨリ組織ニ生物學的惡性ヲ帶ビル時期ヲ過ギテ尙ホ塗擦ヲ繼續セバ癌發生ヲ早カラシムルヲ斷定シ得。

テーる塗擦中斷後長時日ニシテ發生セル潛伏癌ヲ檢査セルニ、細胞ノ浸潤性增殖ハ常ニ乳嘴腫或ハ分離シ增殖セル毛囊頸ヨリ起レリ。此ノ事實ハ先ヅ癌腫化スルハ細胞分割ノ盛ナル部位ノ細胞ナルヲ裏書ス。

○抄　錄

有スルモノニ發生ス。斯ル核分剖ノ存在ガ癌發生ヲ容易ナラシムルカ又ハ癌腫化ニ必須不可缺ノモノナラン。

カクテ H.—T. Deelmann 氏ハてーる塗擦セルまうすノ皮膚ヲ傷害セバ癌發生ハ更ニ速ナルヲ證明セリ、細胞分剖ト其ノ癌腫化ニ就テノ此ノ關係ハ非常ニ重要ナルモノニシテ、余ハ此ノ點ニ關シ二三ノ觀察ヲ論述セン。

實驗的てーる癌ノ前驅期ハ著シキ細胞分剖ニテ、表皮竝ビニ下層ノ結締組織ニ著明ナル增殖ヲ呈ス。早期ニてーる塗擦ヲ中止スレバ早晩增殖ハ退行シ癌發生セズ、尙ホ增殖層ハ潛伏期以上ニ永續スレド癌發生ヲ認メズ（良性實驗的腫瘍）、此ノ重要ナル實驗ハ、癌腫ヲ發生セシムル原因ノ作用ニ就キテ細胞分剖ヲ刺戟スルコト、癌發生自身トヲ區別セシム。

同意義ニ於テてーる塗擦ノ影響ノ下ニ乳嘴腫ガ最初發生シ後消失シ次デ乳嘴腫ノ新シキ發育アリ、コノモノガ後ニ癌ニ成長スルコトハ屢〻アリ此レモ右ト同樣ノコトヲ意味ス。

臨牀上普通ノ疣竝ビニこんじろーむガ往々巨大腫瘍等ニ增大スルアリ。コレモ同ジク細胞ヲ分剖セシメル刺戟ハ其レ自身トシテハ細胞ノ癌腫化ヲ導クモノニハ非ザルヲ指示ス。

表皮ノ增殖ニハ皮膚再生ニ重要ナルアル中心部アリコレヲ好發部位トス、卽チ毛嚢、精確ニ云ヘバ其ノ頸部ニアリ、何ントナレバ頸ノ基部ニ始マル毛髮ノ再生ハてーる塗擦ノ影響ニヨリ直刻止マレバナリ、又毛嚢頸部ノ大部ハてーる塗擦中衰滅シ僅カニソノ一部ノミ殘存シ皮膚內ニ隔離シ又ハ偶々小群ニ集マリテ散在ス、斯ル毛嚢頸群ヨリ後增生ヲ來シ乳嘴腫ヲ生ズ。

若シ充分ニ長時塗擦ヲ繼續セバ、組織ハ癌腫化サレタルモ尙ホ細胞浸潤性發育始マラザル或ル時期ニ到達ス。此レ鏡檢セルニ增殖變性化ノミヲ認ム（生理學的惡性期）。

此ノ事實ハ次ノ摘要ヨリ生ゼリ。

若シ二三ケ月後ニ塗擦ヲ中止スルニ當時ハ皮膚ニ肉眼的ニハ殆ド變化ナキモ數ケ月後ニ乳嘴腫發生シ、更ニ其レヨリ後癌發生ノ始發點ニ變化ス（表二參照）

又一方てーるヲ四ケ月間塗擦セシニ、全部ノ鼠ニ癌發生セリ、塗擦時間短縮セルニ卽チ十三匹ニハ三ケ月塗擦セルニ十匹ニ癌樣ヲ認メ、十六匹ニハ二ケ月塗擦セルニ三

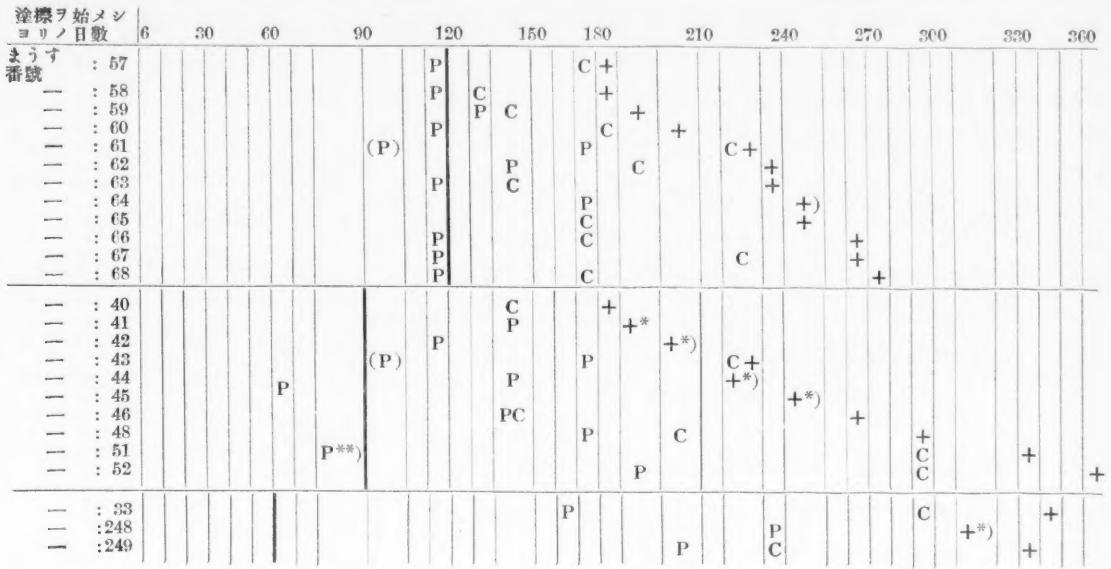
第二百四十八番　まうすニハ毛嚢顫ヨリ遠カラザル部ニ浸潤性增殖ヲ缺ク乳嘴腫ト癌始期ヲ認メタリ。幾多ノまうすニハ加之ニ癌ノ始期ヲ伴ヘル上皮嚢腫ト癌腫ヲ伴ハザル嚢腫ト相竝ベルヲ見出セリ、是等二ツノ實驗例ハてーる癌ハ必然的ニ局所性影響ニ歸スベキモノニシテ、生體ノ一般的影響ニ基クモノニハ非ザル假說ヲ確證ス。

扨テ余等ノ最モ發生病理ヲ精知セルてーる癌ハてーるノ局所的影響ニ因ルカ或ハてーるノ長キ影響ノ下ニ於テ吸收ノ結果ニ由ル生體ノ一般中毒ニ基クコトノ問題ガ討議サレタルハ既知ノ事ナリ。

併シ數多ノ報告例ヨリ見ルニ、一回ノてーる塗擦ニヨリテ時ニハ直チニ或ハ潛伏ヲ經テ癌ヲ惹起セシムルニ足ルコトヲ認ム、此ノ觀念ヲ確證スルハ就中動物實驗ナリ。何トナレバ實際吾々まうす鼠ノ皮膚ニ特發性癌ヲ認メザルガ故ニ此ノ場合癌ヲ發生セシメタルハ加熱セルてーる或ハ硝子棒ニヨリ火傷ニ基クモノナル可シ。斯クシテ癌ノ發生原因トナレルモノハ局所的影響ナラザル可ラズ。然ルニ從來記載サレタル實驗例ノ何レニモ或ハアリ得ルヤモ知レザルモてーるノ慢性全身中毒例ガ問題トナリ得ルモノハナシ。

てーる癌ノ發生ノ狀態ヲ觀ルニ、一定ノ期間即チ準備期中細胞ハ分割シ良性ノ新生物ヲ形ヅクリ、其ハ漸次癌ニ變化ス。加フルニ癌ハ先ヅ細胞分割ノ好發部ニ始マルコト又てーるヲ生物學的惡性期以上ニ長ク塗擦シ、或ハ組織ニ乳切ヲ加フルトキハ、癌腫ガ一層速ニ發育スルコト、又長時日組織中ニ潛在性ニ止リ得ルコト、コレラノ事實ヨリ觀レバ細胞ハ組織ニ浸潤スル能力ヲ得ルタメニハ一定數ノ分割ヲ經ザル可ラズ、且ツ分割速カナレバ一層速ニ浸潤性ヲ帶ビルニ到ル可シ。

尙ホ一般ニ組織ハ細胞浸潤ニ對シ一定度ノ抵抗ヲ有ス、故ニ癌性化ハ結局(一)細胞分割ヲ起サシメルニ充分ナル刺戟(二)細胞ノ浸入セントスル組織ノ局所抵抗ノ弱クナルコトニ歸緣ス、卽生體ニ作用シ細胞分割ヲ促進シ且ツ同時ニ周圍ノ組織ヲ薄弱ナラシメ得ル作用ノミガ癌ヲ發生セシメ得。偖次ギニ正常細胞ガ惡性ヲ獲得スル迄ノ發展ヲ毒性ノ增大ト稱シ、癌腫ニ於ケル新假說——傳染病ノ病理學ニ擬シタル表現ヲ用ヒタル——ヲ說明セン。



垂直ノ太線ハ塗擦中止ヲ示ス、P：乳嘴腫樣發生始期、(P)：癌ニ移植スルコトナクシテ消失セル乳嘴腫、*長時日後ニシテ新シク乳嘴腫發生、C：觸診ニ依リ皮膚ニ浸潤或ハ癌樣ヲ呈セル潰瘍ノ確定、＋：動物ノ斃レシ日附、＋)塗擦セル部位ノ鏡檢ニ依リ始メテ癌始期ヲ確ム

ビ種類ニ關係アリト推定シ得ベク、此ノ推理ハ動物ノ生命ガ長ケレバ長キ短癌發生ハ漸次性ナリト云フ從來ノ假定ニモ據點ヲ有ス。

潛伏時間ハ幾分動物ノ種類ニ關係ス、例ヘバまうすニテハ九ケ月ニシテ、人間ニ於テハ多年ヲ要ス。局所ノ或ル一定ノ病的狀態ガ癌發生ノ時期ニ重要ナルハ勿論ノコトナリ。例ヘバ細胞分剖ノ潛勢力ヲ有スル母斑或ハ良性腫瘍等ハ正常組織ヨリ一層容易ニ癌性化ス。

上述セル此等ノ全條件ノ總體ハ個體ノ局所或ハ全身ノ素因ニ對シ決定的タル可シ。

今日迄尙ホ解明サレルニ到ラザリシ腫瘍學ノ爾餘ノ現象ニ就テノ說明ニ上述ノ事柄ヲ適用セバ斯ル見地ノ正當性ナルカ否カハ判明スベシ。此等ノ現象中ニ、余ハ既ニ例證ヲ引用セシ急性竝ビニ潛伏性癌、癌—肉腫、又らぢうむX線ノ組織ニ作用シテ或ハ癌ヲ發生シ又癌ヲ治癒セシムル事實ヲ擧ゲン。

素因ヲ有スル個體ノ細胞ガ第二次性刺戟ニ依リ急速ナル細胞分剖ヲ促進セラレ、同時ニ周圍組織ノ抵抗力ガ衰ヘ上皮細胞ノ毒力ニ對應スル抵抗力ヲ失フ時ハ癌發生スベシ。此ノ事實ハ火傷ニヨル急性癌ノ實驗ニ示サレタリ、即チ始メヨリまうすハ絕エズ瘢痕部ヲ烈シク搔キテ火傷ニヨリ豫メ盛ントナリシ細胞分剖ヲ繼續セシメタリ、モシ之ニ反シ、カク半バ惡變性トナレル細胞ガ周圍組織ニ包裹セラレテ居レバ、癌出現ヲ導クガ如キ新刺戟ガ來リテ細胞分剖ヲ喚起セシム迄ハ永ラク靜止狀態ニ止ルヲ得シナラン(火傷性潛伏癌)。

癌—肉腫ノ病理ハ常ニ論爭ノ的ナリキ。本論ニ記載セラレシ例ハ一見說明シ難キモノヽ、如シ。一般ニ骨組織面ニ於ケル癌轉移ハ破壞的ニシテ、換言セバ細胞ノ惡性ハ母組織ノ抵抗ヨリ遙カニ大ナルハ既知ノ事ナレバ、稀ニハ反對ノ例アリ。卽チ癌細胞ハ骨細胞ヲ刺戟シテ骨組織ノ生成ヲ促ス。コハ骨組織ノ抵抗ガ細胞ノ惡性ニ對シ平衡ヲ保テルカ或ハ寧ロ凌駕セル場合ニオコリ得ベシ。

本論ノ初メニ示セル癌ノ肉腫ノ例ニモコレト同一ナル連續的發生ヲ推想スルヲ得、卽チ變性セル上皮細胞ハ最モ接近セル造結締織細胞ノ分剖ヲ促シ、斯クシテ後者ハ漸次恐ラクハ血液喪失ニヨリ續發的ニ低下セル生體ノ抵抗ヨリ大ナル惡性ヲ獲得スルニ至リシモノナランカ。

細胞ノ「有毒性」(卽チ惡性)トハ癌腫化影響ノモトニ分割シ同時ニ周圍組織ニ浸潤スル能力ヲ得タル時ナリ。休息セル正常細胞ノミハ完全ニ無毒性ニテ、細胞分割ノ總ベテハ全ク獨立性卽チ自働性 autonomie トイフベク、有毒性細胞ノ獲得セル性質ハ正常細胞ノ性質トハ本質的ニ異ナルモノニ非ズ、正常細胞ト惡性細胞トノ間ニハ確然タル區劃ハナシ、卽チ一方ヨリ他方ニ徐々或ハ漸次ニ移行ス。

細胞ガ惡性トナリタル後モ、其ノ惡性ハ增加スルモノ、如ク思ハル、此レハ又 Brown, Pearce, von Allen 氏等ノ研究ニヨリ明瞭トナレリ。氏等ハ實際ニ兎ノ惡性腫瘍ヲ再三移植スルコトニ依リ細胞增植ノ勢力ハ動物通過ニヨリ著シク增加スル」事ヲ證明セリ。

此ノ實驗ニ贊同シ、生體組織中ニテ細胞ガ發育スル間ニ惡性ノ爾後增加ヲ推想スレバ、カ、ル惡性細胞ガ癌性化要因ニヨリ組織抵抗ヲ薄弱ナラシメルガ如キ影響ヲ蒙ラザル部位ニ於テモ增殖シ得ルヲ理解セシム。

吾々ガ「生物學的惡性」ナル名稱ノモトニ明示シタル組織ノ狀態ノ說明ニ此ノ概念ヲ持チ來タセバ、生物學的惡性ナル組織トハ細胞分割ニヨリテ周圍組織ノ抵抗ニ對シ平衡ヲ保ツ程度ノ毒性ヲ有スル組織又ハ細胞ナルヲ知ル、(譯者曰ク再生的分割ト區別無キカ)

モシ此ノ抵抗力ガ弱クナルカ又ハコノ弱毒性細胞ノ分割ヲ更ニ刺戟スレバコ、ニ潛伏性癌ハ曝發シ出ヅルナリ。

組織ヲ薄弱ナラシムル原因トシテ次ノモノガ想像サル年齡、併發症、神經性影響(此ノ意義ニ於ケル市川氏ノ癌性腫瘍ノ神經小纖維ノ示說ハ重要ナリ)癌性化動原ノ連續的影響竝ビニ內的影響等。

細胞分割ヲ惹起セシムル刺戟トシテハ卽チ非常ニ種々ナル影響アルモ、其ノ中ニハ力學的器械的ノモノアリ、コレニヨレバ外傷後癌ガ突發スルコト(外傷性癌)或ハ刺戟ニ因ル癌ニ就キテ舊來ノ實驗等ガ說明シ得ラル。

生體ガ細胞分割ヲ起サシメル刺戟ニ又ハ細胞分割セル部ヲ圍メル組織ノ減弱等ニ對シ取ル方法ハ種々ナリ、細胞層ノ增殖モコノ一法ト見ルベク、カクシテ基底細胞—此ノ細胞ノミ癌性化シ得ル—ハ有害ナル刺戟ノ直接影響ヨリ除外サル。中毒性影響アル例ニ於テハ、抗毒體ノ形成ハ癌性化ニ對抗スルモノナル可ク、且又正常細胞ノ壽命竝ビニ一細胞ガ惡性化スル迄ニ行フ分割數ハ多分動物ノ年齡及

(3)異常細胞分割ノミニテハ癌細胞發生ニハ不充分ナリ(良性增殖)爾後ノ變性ヲ要ス。

(4)正常細胞ガ悪性ヲ帶ビルニハ繼續的細胞分割ニヨル發育ヲ要ス。卽チ次ノ如キ表式ヲ以テ示スヲ得。

潛伏期(生物學的悪性)—發育

細胞ノ此ノ發育ニ明瞭ナル表現ヲ與ヘルタメニハ、吾々ハ其ヲ「毒性ノ增加」ト稱ス。

(5)細胞分割ハ細胞ノ毒性ヲ增加ス(潛伏性癌ハ常ニ細胞分割ノ著シキ部ニ發生ス)。

(6)癌ニ必須ナル決定的變性ハ周圍ノ環境ノ變化ナラザル可カラズ(周圍組織ハ癌細胞ノ浸潤ニ對シ抵抗ヲ有ス)

(7)癌性化ノ全要因ハ一般的觀念ヨリシテハ、細胞ヲ刺戟シ分割セシメ、組織ノ抵抗ヲ弱メルモノニ歸セラル。

朝鮮ニ於ケル癌

(A. S. Ludlow. Cancer in Corea, China Medical Journal 1929, May.)

癌ハ云フマデモナク世界各國民ノ恐ルベキ敵デアルガ、朝鮮ニ於ケル癌ニ關スル研究ハ何等報告サレテオラヌ樣デアル。

ソコデソレニ關シテ先ヅ一九二二年四月ヨリ一九二七年四月ニ至ル間ノセヴェランス病院ノ入院患者一萬人ノ中ノ癌患者數ニ就イテ述ベテ見ル事ニスル。

セヴェランス病院ハ朝鮮京城(人口三十萬餘)ニアリ、「ベット」ノ數ハ百、入院患者ハ年平均二千人位デアラユル階級ノ患者ヲ網羅シ內科、外科ヲ始メ各科ノ設備ガアル。

(一)病院患者ノ年齡

一九二六年四月一日ヨリ一九二七年四月一日ニ至ルセヴェランス醫學專門學校附屬病院外來患者ノ統計、一九二七年ニ於ケル同病院入院患者及ビ米國オハイオ州クリーヴランドノレイクサイド病院ノ入院患者ノ統計等ニヨルト朝鮮人ノ外來患者ト入院患者ノ年齡關係ハ殆ンド同ジデアルシ、又朝鮮ニ於ケル入院患者ト米國ニ於ケル入院患者ノ年齡關係モ大體同ジデアル。タヾ米國ニ於テハ女子ノ方ガ男子ヨリ多數ナルニ反シ、朝鮮ニ於テハ男子ノ方ガ女子ヨリモ多數デアル。

朝鮮ニ於テモ矢張リ老人ハアマリ病院ニ行カヌ樣デア

○抄錄

サテ癌發生原因ノ總體ヲ縱メ共通點ヲ見出スハ常ニ困難ナルコトナリ、從ツテ傳染說ガ長ラクノ間幾多ノ信奉者ヲ有シタルハ疑モナク此ノ事實ニ基ク、加之、組織ニ及ボス甚ダ異ナレル影響ヨリ病理學的ニハ同一ノ變化ニ到達スルハ理解シ難キノ觀アリ。此等幾多ノ影響ハ非常ニ複雜ナル性質ヲ有スルモノニシテ、例ヘバてーるノ如キハ數百ノ化學的組成物ヨリナルガ如シ。斯ル作用ヲ二ツニ卽チ一ハ細胞分割ヲ促ス刺戟ト他ハ局部ヲ弱メル コトニ分テバ、種々異ナル癌化影響ノ不同ハ容易ニ調和セラル。てーるニ關シテハ化學的組成ノ一ハ細胞分割ヲ促進シ他ハ塗擦セラレタル組織ヲ弱メルハ可能ナリ。

光線ノ影響ニ關シテハ—太陽ノ光線、らぢうむ、X線—此等ノ光ガ表皮細胞ニ及ボスモノト深部層ノ細胞ニ與ヘル影響トハ異ナルハ想像スベシ。

X線僅量ハ細胞ヲ刺戟シ、細胞分割ヲ盛ナラシムル作用アルハ旣知ノ事ナリ、從ツテX線ノ放射サレタル部ノ周邊部ニハ必然斯ル作用オコル。之ニ反シ放射部ニ於テハ線量強ケレバ表皮細胞分割ノ中斷ヲキタシ、組織ノ抵抗ハ上昇ス、モシ餘リニ強キ量ヲ組織ガ受クレバ此ノ抵抗ハ動搖シ、投射分野ノ周邊部ニ於ケル細胞ハ强ク刺戟サレ分割ヲ行ヒ、結締組織ニ對シ惡性ヲ增加スルニ到リ、遂ニ浸潤ヲ始ム。

癌ノ病理學ニ關シテノ上述ノ概念ハ全ク假說ニ過ギザルモ幾多疑フ可カラザル特點ヲ有ス、先ヅ此ノ假說ハ綿密ナル觀察ニ(一部ハ實驗ヲ施セリ)基キ、事實此レラノ觀察ヲ明確ナル概念ノ下ニ分類セル ニ過ギザルヲ述ベザル可ラズ、次ニ此ノ假說ハ隔意ナク從來全ク理解シ能ハザリシ事實ニ對シ幾多ノ點ニ於テ明瞭ニシテ且ツ容易ナル說明ヲ呈示シ、最後ニ癌ノ本質竝ビニ原因上ノ研究ニ止マラズ、治療上ノ進步ニ新機軸ヲ開クモノ、如シ。

コノてーる 癌或ハ瘢痕癌ノ發生ノ經驗ヨリ得シ觀念ハ、多クノ癌病理學者ガ異ナレル他ノ方法ニ基キ癌發生論ヲ研究シテ得タル觀念トヨク一致セルヲ吾人ハ推思ス。

以上ヲ摘要シテ此處ニ主要ナル點ヲ擧グレバ次ノ如シ。

(1)癌細胞ハ正常細胞ヨリ發生ス(てーるヲ塗擦セルまうすノ皮膚ニハ百「パーセント」ノ率ニテ癌發生ス)、癌細胞ハ周圍ノ環境ニ關係シテノミ存在スルハ勿論ナリ。

(2)癌細胞ハ局所ノ病的過程ニ原因ス(實驗的急性癌)

一九二二年四月ヨリ一九二七年四月ニ至ルセヴェランス病院ノ入院患者一萬人（男六千三百人、女三千七百人）中ノ癌患者ノ數ヲ調ベテ見ルト、第一表ニ示ス如キ數ニナル（別表參照）。

但シ朝鮮ニ於ケル醫學ハ尚發達不充分デアルシ、且上記ノ統計ハ入院患者ニ就イテノミデアルカラ、外來患者ノ樣子ガ判ラヌバ眞ノ消息ハ知リ得ナイノデアル。

東洋ニ於テハ西洋ニ於ケルヨリモ、癌ガ比較的若イ時代カラ起ルト云ハレテヰルガ上記ノ癌患者ヲ四十歲前ト四十歲後トニ別ケテ見ルト第二表ニ示ス如キ結果トナル（別表參照）。

以上ノ統計ニ依ツテ見ルト、胃癌ハ他ノスベテノ部分ノ癌ノ數ノ總和ニ略ゝ等シク、子宮癌モ他ノ國ニ於ケルト略ゝ等シキ比ヲ示シテヰルガ玆ニ陰莖癌ガ非常ニ高率ヲ示シテヰル事ハ、注目スベキ價値ガアルト思フ。乳癌ノ率ガ歐米ノソレニ比シ非常ニ低イガソレハ手術不可能ナモノトシテ入院サセラレナカツタモノガ多數アツタ爲デアラウ。ソノ他ニ就イテハ特ニ目立ツ事モナイ樣ニ思ハレル。

最後ニ、今後、朝鮮ニ於ケル醫學ノ進歩ニ伴ヒ朝鮮人ノ中ニモ單ニ癌ト云フダケデナク、癌ノアラユル種類ノモノガ歐米人ニ於ケルト同ジ位ニ多ク見出サレルデアラウト云フ事ヲ附言シテオク。（山口抄）

○抄錄

ル。

又一九二五年度ノ朝鮮人口ノ年齢ノ統計ト比較シテ見ルト、

セヴェランス病院ノ入院患者、外來患者ノ年齢分布ハ全住民ノ年齢分布ト略ゝ同一デアル。

（二）癌患者數

第　一　表

解剖學的分布	性 男	性 女	計	年齢 25—30	31—40	41—50	51—60	61—70
1 胃	58	17	75	2 2 4	14 2 16	19 7 26	21 3 24	2 3 5
2 子宮		15	15	1	5	6	2	1
3 陰莖	13		13	0	4	5	3	1
4 乳腺	1	5	6	0 0 0	0 0 0	0 1 1	0 3 3	1 1 2
5 皮膚	4	2	6	0 0 0	1 0 1	2 2 4	0 0 0	1 0 1
6 腸	4	1	5	1 0 1	1 1 2	1 0 1	1 0 1	0 0 0
7 肝	4		4	0	1	2	0	1
8 直腸	1	2	3	0 0 0	1 0 1	0 1 1	0 0 0	0 1 1
9 卵巢		3	3	1	0	1	1	0
10 甲狀腺	1	2	3	0 0 0	0 0 0	0 0 0	1 2 3	0 0 0
11 上顎竇	2	1	3	0 0 0	0 0 0	1 1 2	1 0 1	0 0 0
12 腟		2	2	1	1	0	0	0
13 食道	2		2	0	0	2	0	0
14 下顎	2		2	0	0	0	2	0
15 膀胱	1	1	2	0 0 0	0 0 0	0 1 1	0 0 0	1 0 1
16 腎	1		1	0	0	0	1	0
17 眼窩	1		1	0	0	1	0	0
18 腸間膜		1	1	0	0	1	0	0
19 腹膜後方		1	1	0	1	0	0	0
20 鼻腔	1		1	0	1	0	0	0
21 多發性	1		1	0	1	0	0	0
總計	97	53	150	3 5 8	24 10 34	33 21 54	30 11 41	7 6 13

第　二　表

年齢	男 患者數	男 比率	女 患者數	女 比率	計 患者數	計 比率
25—40	26	17.33	15	10.00	41	27.33
41—70	71	47.33	38	25.33	109	72.67
計	97	64.66	53	35.33	150	100.00

左記ノ者ハ定款ノ規定ニ依リ總裁ヨリ理事タルコトヲ囑託セラレ昭和四年五月二十八日就任ス。

東京市赤坂區檜町一番地　南　大　曹

東京市本郷區駒込富士前町七十八番地　宮　川　米　次

東京市芝區三田綱町十番地　澁　澤　敬　三

右昭和四年六月三日東京區裁判所ニ於テ登記變更申請ヲ了ス。

○目的の變更登記

昭和四年四月三日定期總會ニ於テ目的變更ヲ決議シ、同年五月十七日附文部大臣ノ認可ヲ得本會ノ目的ヲ同日左ノ通リ變更ス。

「本會ハ癌ニ關スル研究及ビ研究ノ奬勵ヲ爲シ、又ソノ豫防、撲滅ヲ計ル」

但シ目的ニ對スル認可書ハ昭和四年五月二十五日到達ス。

右ハ昭和四年六月三日東京區裁判所ニ於テ登記變更申請ヲ了ス。

○篤志家ノ寄附金　昭和四年七月十一日附ヲ以テ麻布區本村町三七、柳莊太郎氏ニハ本會ノ主旨ヲ贊助セラレ、金壹百圓也ヲ癌研究病院建設資金中寄附セラル。

○國家的らぢうむ購入資金

次ニ抄譯シタ一文ハ Journal of the American Medical Association Vol 92. No. 23. Foreign letters 中ノ "National Radium Fund" ナル標題デ揭載サレタ五月十一日附ロンドン通信デアル、英國ニ於テハ世人ガ對癌施設ニ對シ熱心ナル援助ヲ與ヘツヽアルヲ知ルコトガ出來ル。

今ヤ專門醫學者ノミナラズ一般世人モ逐年增加シツヽアル癌ノ治療上ニ、らぢうむ療法ガ一道ノ光明ヲモタラシタコトヲ注目スルニ至ツタ、コノ目的ヲ達成センニハ現在ノらぢうむ量デハ不十分デアリ更ニ大量ヲ要スル所以ハ前文ニ述ベタ所デアル、ソコデ Royal Colleges of Physicians and Surgeosn ノ學長及醫學界知名ノ士ガ發起人トナツテらぢうむ購入資金ヲ一般世人ニ仰グコトニナツタ、ソノ趣意書ノ中ニハ癌ノらぢうむ療法ガ根本的治療法デアルコト及英國ニ於ケルらぢうむ量ハ少量ナルタメ治療上ニ十分ノ成績ヲ擧ゲルコトガ出來ナイコトヲ指摘シテ居ル、又、癌ハ唯ニ老人、衰弱者ニ發生スルノミデハナク、强壯ナル男女モ癌ノタメニ働キ盛リニ命ヲ奪ハレテシマウ、英國本土丈ケデ子宮癌ノタメニ斃レル女子ハ一年ニ四千人ヲ算シ而シソノ中ニハ母ナル人ガ多イ、ソウ云フワケデ發起人

雜　報

○理事會　昭和四年七月一日午後六時ヨリ築地錦水ニ於テ新任理事宮川、南兩博士、澁澤氏等ノ歡迎會ヲ兼ネ第三回理事會開催。

出席者、長與會頭、稻田、鹽田兩副會頭、磯村、佐々木、高木、宮川、南、澁澤各理事森村監事山川治療所主任及市川書記。

報告事項

長與會頭ヨリ左記各項ノ報告アリ。

一、新任理事ノ報告

二、文部大臣ノ定款變更認可ニ關スル件

三、故本多會頭墓前獻燈ニ關スル件

四、本多未亡人春子殿ヨリ「らじうむ」寄贈ノ件

山川博士ヨリ

最近ノ附屬腫瘍治療所成績ニ關スル報告アリ。

協議事項

一、中元手當支給ニ關スル件

二、增給ニ關スル件

三、中原博士渡米癌視察補助金ニ關スル件

四、寄附金ニ關スル件

五、第二十一回學術集談會授賞論文審査委員囑託ニ關スル件

六、癌ノ豫防宣傳準備ニ關スル件

○授賞論文審査委員囑託　第二十一回學術集談會授賞論文審査委員トシテ左記諸氏ヲ囑託ス。

醫學博士　山極勝三郎
醫學博士　藤浪鑑
醫學博士　長與又郎
醫學博士　稻田龍吉
醫學博士　木村男也

○米國ニ於ケル癌研究狀況視察囑託

本會囑託員中原和郎博士今回渡米スルニ付キ米國ニ於ケル癌研究狀況ノ視察方ヲ囑託ス。

○理事變更登記

理事左記ノ者ハ昭和四年五月二十八日辭任ス。

鹽田廣重
稻田龍吉

昭和四年九月二十七日印刷
昭和四年九月三十日發行

癌
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一册正價金壹圓五拾錢
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社團法人癌研究會
振替東京參〇〇七壹番

ハ全英國民ニ對シ十分ナル量ノらぢうむ購入資金ノ寄附ヲ仰イデ居ル、購入費ハ一・二五〇・〇〇〇弗ノ豫算デアル。

政府ハ應募寄附金一・〇〇〇・〇〇〇弗以内ノ金額ニ對シテ五〇〇・〇〇〇弗ノ補助ヲナスベキ決議ヲシタ、コノ寄金募集ニ對シ世人ハ直チニ共鳴シタ、皇帝ノ全快ニ對スル特別感謝資金ハ皇帝ノ意志ニ從ツテ在ロンドン諸病院ニ寄附サレタ、アル人ハ無名デコノ感謝資金ニ對シ寄附金中最高額ナル五〇〇・〇〇〇弗ノ寄附ヲシタ。而シテ僅カ一週間デ寄附金總額ハ一・六〇〇・〇〇〇弗ニ達スル有樣デアツタ、ソノ中七五〇・〇〇〇弗ハコノ National Radium Fund ニ分配サレタ、コノ額ハ始メノ豫算額ヲ超過シ政府ノ補助金ヲ加ヘレバ必要ナルらぢうむ量ヲ購入スルニ十分ナモノデアル。